CRANFIELD UNIVERSITY

ELOISE NASH

THE DETERMINANTS AND EFFECTS OF EFFECTIVE INVESTOR RELATIONS (IR)

SCHOOL OF MANAGEMENT

PhD THESIS

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Academic Years 2001 – 2004

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The Determinants and Effects of Effective Investor Relations (IR)

Supervisor: Professor R.J. Taffler

April, 2005

Acknowledgements

This research is jointly funded by the *Economic and Social Research Council* (E.S.R.C.), through their Collaborative Award Studentship Award (CASE) scheme, and by the UK *Investor Relations Society* (IRS). I am grateful to the IRS for their support and their assistance in obtaining access to the information and contacts that have been instrumental throughout my doctoral research. I also thank Richard Davies, of RD-IR, who provided the data on the UK *IR Magazine IR Awards* and to Neil Stewart, former editor of UK *IR Magazine*, who provided the data on the US *IR Magazine IR Awards*.

I express my gratitude to my supervisor, Professor Richard Taffler, for his emotional support and academic input and guidance throughout my doctoral programme and for his enthusiasm in, and encouragement for, my research. I would also like to thank Lance Moir and Professor Sudi Sudarsanam for their advice and guidance in relation to my research and to all my colleagues and the support staff at Cranfield University.

Mostly though, I owe my gratitude to my parents, Tony and Judy Nash, and to my family who have given me the personal and financial support, without which this research would not have been possible.

The Determinants and Effects of Effective Investor Relations (IR)

Abstract

This research concerns relationships between effective IR and stock pricing and stock liquidity and analyst coverage. This thesis develops the IR literature by using an original and focused measure of IR performance, numbers of firms' nominations for the *Investor Relations Magazine* IR awards 1999-2002, and by testing for any direct relationships between firms' number of award nominations and stock price, liquidity and analyst coverage over periods surrounding these awards and by exploring a wider range of firm characteristics compared to existing research.

It is motivated by a seminal paper claiming that effective IR indirectly reduces the cost of equity capital, based a chain of existing research (Brennan and Tamaronski, 2000). Firstly, effective IR increases analyst coverage by reducing analysts' information-search costs, (Bhushan, 1989b, Lang and Lundholm, 1996, Francis, Hannah and Philbrick, 1997, Holland 1998b). Higher coverage can directly reduce information asymmetry and trading costs, increasing liquidity and indirectly increasing equity trading volumes (Brennan and Subrahmanyan, 1996). Finally, Amihud, Mendelson and Lauterbach (1997) show a direct inverse relationship between stock liquidity and stock prices, thus completing the putative chain between effective IR and a reduced cost of equity.

However, any research showing a direct relationship between effective IR and the cost of capital is limited, with Botosan (1997) only finding a direct negative relationship for a sample of US firms with effective annual reports and low analyst coverage, and more recent research by Botosan and Plumlee (2002) shows no relationship to firms' IR ratings from analysts of the Association of Investment Management and Research (AIMR).

I find, firstly, that prior to the IR awards the smaller-sized firms earn excess equity returns and a positive relationship between the number of firms' IR award nominations and prior analyst coverage. Secondly, I find that subsequent to the IR awards the firms continue to have high levels of analyst coverage, but do not earn excess stock returns. These findings suggest that analysts cover high momentum small-firm stocks and generally follow firms with effective IR, and also contributes to other research on prior factors that appear to influence firms' ratings in subjective firm-surveys, which behavioural finance attributes to the survey respondents' psychological preferences and biases.

Finally, I find that effective IR is associated with a subsequent significant increase in stock liquidity and a reduced cost of equity, consistent with information risk and agency theories, which predict that effective IR will reduce risks attached to stocks due to high information asymmetry.

The Determinants and Effects of Effective Investor Relations (IR)

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Research Summary

1.1 Motivations for this research

Efficiently functioning capital markets require a free flow of relevant information to ensure fair and unbiased asset pricing. However, until recently, little attention was paid in the literature as to whether firms' communication strategies can affect market prices. This thesis contributes to this literature, by testing whether a firm's investor relations (IR) strategy can affect its stock pricing, stock liquidity and analyst coverage and whether these factors also appear to determine or influence market' opinions on firms' IR strategies.

It is primarily motivated by a recent research paper, which demonstrates "...*a direct link between a firm's investor relations policy and its stock price*" (Brennan & Tamaronski, 2000). In this paper Brennan and Tamaronski put forward a set of propositions, based on the findings of some existing empirical research, that together establish an indirect, but clear, causal chain between effective IR and a reduced cost of equity capital. This chain of causation is demonstrated in the following parallel strands of empirical research.

Firstly, there is research showing that effective IR communication strategies can reduce the costs of information-search for security analysts, and thereby directly increase analyst following (Bhushan, 1989b; Lang and Lundholm, 1996; Francis, Hannah and Philbrick, 1997; Holland 1998b). Then there is evidence that higher analyst coverage has a significant positive impact on stock liquidity directly, due to reduced trading costs for investors and market makers, and can indirectly lead to increased equity trading volumes (Brennan and Subrahmanyan, 1996). Also, increased liquidity has been shown to be a major determinant of a firm's cost of capital, and therefore to directly affect stock prices (Amihud, Mendelson and Lauterbach, 1997).

A second key driver for this thesis is Botosan's (1997) seminal study, which offers evidence of a more direct link between a firm's IR activities and its stock price.

Botosan finds weak, but significant, evidence of a direct negative relationship between the level of firms' financial disclosures and cost of equity capital for a sample of 122 US firms in the metals and machinery industry in one year in the early 1990's. In this study, Botosan rates the firms' level of disclosure using a subjective disclosure index that measures how much discretionary financial information is disclosed by the firms in their 1991 annual report. Botosan generalises a firm's disclosure index score to the quality of the firm's overall communications, by relying on the fact that "*firms that opt to disclose more information in their annual report generally rank highly on other measures of information disclosure and investor relations*". However, because the index does not actually focus on the firm's IR performance, Botosan's (1997) findings are probably only relevant to the quality of the more formal corporate communications measured by her disclosure index.

Further, Botosan finds that a negative relationship between disclosure quality and the firm's cost of equity depends on the firms' level of analyst following. For firms followed by many analysts (above the median number in her sample) no relationship is found, but firms with low analyst following and a higher disclosure index score experience an almost 10% reduction in their cost of equity capital. Botosan suggests that this is because firms with high analyst following are able to rely on informal communications with their analysts as a more effective and efficient means of managing the cost of equity capital, rather than by communicating via formal financial reporting. This proposition and the findings of this study largely motivate my thesis to further explore relationships between effective IR and levels of analyst coverage.

IR is still a relatively nascent and growing industry, perhaps because only since the 1950s has the body of external stockholders been large enough to encourage the development of an IR industry that can provide this more specialised channel of corporate communications. In fact, not until 1953 was the first dedicated corporate IR department formed, by General Electric Co. in the US. Then, following a series of conferences held by the American Management Association, the US National Investor Relations Institute (NIRI) was formed in 1969, and the UK Investor Relations Society (IRS) in 1980, which both aim to provide a professional forum of guidance

and support for a growing body of in-house IR managers. Indeed, a recent survey of 90 quoted European firms across 18 different countries, published by the Institute of Chartered Accountants of Scotland (ICAS) (Marston, 2004), finds that 90% of these firms now have a full-time IR officer in a separate IR department that had been established on average for 7 years and that on up to £609k on their annual IR budget.

Therefore, a further reason for this research is that, despite this recent substantial growth in the importance placed by firms on their IR function that they presumably perceive to add value in capital markets, the body of literature providing empirical evidence of the value of effective IR remains substantially under-developed. To this aim, my research seeks to more fully explore the value of effective IR.

Firstly, this research seeks to test whether stock prices and analyst coverage levels can determine and/or influence opinions on a firm's IR performance. Secondly, I test whether effective IR performance leads to future excess equity returns, a reduced cost of equity capital, increased stock liquidity and higher analyst coverage.

Thereby, my research asks the following questions, which concern relationships based on the findings drawn from a review of the limited existing literature on IR, and by reference to the relevant literature on information risk theory, agency theory and behavioural finance.

1.2 Research questions

1. Do the following factors significantly determine/drive effective IR?
   - Excess equity returns;
   - High analyst coverage.
2. Do the following factors appear to be significantly affected by /result from effective IR?
   - Excess equity returns;
   - High analyst coverage;
   - A reduced cost of equity capital, and;
   - Increased stock liquidity.

1.3 Critique of the existing literature on IR

There are only three empirical studies that have found evidence of a direct link between a firm's disclosure policy and its market pricing and which I critique here. The first is the aforementioned 1997 study by Botosan, which is one of the main drivers of this thesis. However, it is actually only based on a subjective disclosure measure of information in annual reports, treated implicitly as a proxy for the effectiveness of the firm's overall market communications. Meanwhile, the role of IR is much more than just the mechanics of conveying formal financial information, requiring the successful combination of several specialised formal an informal communication methods and the possession of a complex set of 'hard' and 'soft' skills (see Marcus and Wallace, 1997), and so Botosan's findings make only a tangential direct contribution to the IR literature.

Also its findings are based only on a small sample of firms from a single industry sector and only in the US capital market in the early 1990s, so are probably not generally and currently still applicable. This is because during the 1990s the US capital markets were experiencing bull market conditions that are perhaps less relevant in the current bear climate of global equity markets, where firms face increased competition to obtain low-cost equity financing and increasingly attempt to attract investors using methods to differentiate themselves, such as by placing a higher priority on the quality of their corporate communications. Also since the 1990s a range of new legislation governing the activities of security analysts and the communications and corporate governance of listed firms in both the US and UK have radically transformed equity market information environments. The most notable and controversial of these are the US Regulation Fair Disclosure (Reg. F.D.) in October 2000 and the US Sarbanes-Oxley Act 2002, which together establish a strengthened and new regulatory framework with punitive penalties and heavy fines for contraventions. Likewise UK has seen the formation of the *Financial Services Authority (FSA)* as an umbrella market regulator and new industry legislation and guidance, particularly in the *Financial Services and Markets Act (FSMA)* of December 2001 and in the recommendations made in the *Myners Report* in March 2001, have together also resulted in a new, although less rigid than the US, UK

framework of regulation and guidance for communications between analysts and the wider market and firms. A more comprehensive description of these reformed regulatory environments, to the extent they affect IR, is set out in chapter 2 of this thesis.

In a second key study, Botosan and Plumlee (2002), using a large sample of firms (2,706 firm-year observations over 11 years) representing a wide cross-section of industry sectors, find no significant relationship between the quality of investor relations and the cost of equity capital. In their study IR performance is measured by annual ratings of firms by analysts and fund managers for the quality of the firms' IR from 1986-1996, which was one category of communications rated annually in the, now defunct, survey of corporate communications by the Association of Management and Research (AIMR)[1]. Botosan and Plumlee do not provide any explanations for their findings on IR, which are only reported for the pooled sample of firms over the whole 11-year period studied and not for any particular annual sample of firms or for any individual annual period for the pooled sample. Also, quite apart from current market conditions again being very different to those prevailing during the period of this study, the AIMR ceased performing their communications survey in 1997, and so the research by Botosan and Plumlee (2002) is now out-of-date and is probably not still relevant today. In addition, the AIMR disclosure rating was a composite score, of which a firm's IR performance only comprised a maximum 30% weighting, and so did not provide a 'pure' measure that specifically reflects the value of only a firm's IR activities. Further, Botosan and Plumlee (2002) only test for a relationship with the cost of equity capital and not with any other variables that may be related to disclosure policy quality.

In the third key paper looking at IR, Healy, Hutton and Palepu (1999) test the stock performance of the 97 firms with the largest three-year consecutive increases in AIMR overall disclosure ratings in the 1990s. They find that on average these firms' stocks earned excess risk-adjusted returns of approximately 5% over this period.

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[1] In July 2004 the AIMR changed its name to the Chartered Financial Analyst Institute (CFA Institute) with the stated aim of raising the profile of its analysts' professional qualification, which it governs. Throughout this thesis the CFA is still referred to as the AIMR, because this is how it is referred to the existing literature. The AIMR survey is fully described in section 6.1 of this thesis.

However, Healy et al. restrict their 1999 study to testing only for any relationship between the AIMR rating and equity returns, and not for relationships with any other firm' characteristics, and for only a small group of firms with a sustained improvement in overall disclosure ratings. These firms are not necessarily representative of the typical listed firm, and the findings in this paper once again may be only specific to the bull market conditions that existed then in the US market during the 1990s. Critically though, the separate IR disclosure category in the AIMR composite rating was not separately tested, and so Healy, Hutton and Palepus' results can only at best be a reflection of a relationship associated with a firm's market communications more generally defined.

Finally, in a more recent paper, Bushee and Miller (2005) test 184 small and mid-cap. companies that initiate IR programs between 1999 and 2004 by hiring professional IR agencies and find that these firms significantly increase their level of disclosure and press coverage, stock trading activity, institutional ownership, analyst following and market valuations after hiring IR agencies, both in absolute terms and relative to a control sample of firms matched by exchange, industry, time listed and prior investor following. Bushee and Miller thus show how IR can increase the visibility and stock performance of smaller firms that choose to initiate an IR program. However, my research is distinguished from this because it does not only focus on small firms and tests firms that presumably have more established IR programs because they are nominated for key IR industry awards.

In summary, there is therefore a significant deficiency in the empirical literature specifically relating to the effectiveness of IR. There is a need to build on this limited past research to establish more general and conclusive results, whilst adequately reflecting the dynamic, complex and sensitive communication 'game' that firms appear to play with security analysts and other information intermediaries and with the fund managers at institutions that hold their stock.

1.4 Contributions of this thesis

I believe this thesis represents a significant development in the literature on IR. Firstly, this is because it extends the current literature that has largely focused on the

extent of formal information releases, such as provided in annual reports. My research focuses purely on IR activities, which go well beyond information disclosure per se, involving skills in both formal and informal relationship-building and the establishment of the credibility of the firm's managers and business strategy with investors and information intermediaries. Because my thesis also highlights the important role that analysts play as key information intermediaries between firms and other participants in the capital markets, its findings also contribute to the literature on security analyst' behaviour.

In addition, my research tests for a much wider set of relationships compared to the existing literature, by testing the impact of effective IR on a firm's equity returns, analyst coverage, equity trading volumes and also on the cost of equity capital and thereby explores the value of IR in a much wider sense. Also, because it uses more recent data (1999 to 2002) it is also perhaps a better reflection of the role of IR in a more current institutional and regulatory environment.

Further, IR performance is measured using a measure of effective IR that has not previously been used in any published research; the number of firms' nominations in key award categories of both the *US and UK Investor Relations Magazine IR Awards*. These are 'pure' measures of a firm's IR activities that have a high profile in the IR industry and are recognised by the National Investor Relations Institute (NIRI) in the US and by the Investor Relations Society (IRS) in the UK as the main IR industry awards. They are robust measures because they have been produced on a consistent and professional basis in the US since 1995 and in the UK since 1990. These measures are also superior to the AIMR ratings because, unlike the AIMR, the *IR Magazine* does not predefined the range of firms to be rated but instead asks the respondents to name any one firm they consider to have the "best" IR in specific categories, and so does not have any pre-selection bias that may have affected research using the AIMR ratings.

I have access to data on the number of nominations for all firms in the US awards 2000-2002 and in the UK awards 1999- 2002, so this means I am able to work with large samples (US firms total approximately 3,000 firm-years and UK firms total

approximately 1,500 firm-years) over a period spanning several recent years. Also, because the US *IR Magazine* explicitly compiles a separate IR rating for small firms and large firms, the US data allows for explicit tests of how the value of IR is affected by firm size. In addition, my research tests the UK firms IR ratings for specific forms of IR communication (Best IR Officer, Best Results Meetings with Analysts and Fund Managers and Best Annual Report) and so also tests for the importance of different forms of communications within the wide-ranging role of IR.

Established research methods are used to test my research hypotheses, relating to relationships between IR performance ratings and firms' characteristics in the existing literature and that are also relationships that would be predicted by agency theory, information risk theory and behavioural finance. Together these theories reflect the complex way that the capital markets appear to be affected by the supply of, and demand for, corporate information from firms and other information intermediaries and how participants in these two sides of the information environment interact and how their actions and decisions may influence a firm's capital market variables.

1.5 Key findings

In summary, my research finds some significant relationships between effective IR and equity returns, the cost of equity capital, equity trading volumes and levels of analyst coverage. Firstly, my empirical analyses show that the stocks of smaller-sized firms judged in the *US IR Magazine* IR awards to have the most effective IR have significant prior excess risk-adjusted returns and that there is a significant positive relationship for all the firms between their IR ratings and pre-existing level of analyst coverage. These findings are consistent with those in some of the existing literature and with industry anecdote, which both indicate that more analysts follow large firm stocks and only cover on a small percentage of high growth small firm stocks. In addition, these findings suggest that the respondents to the IR award surveys are influenced by the behavioural biases of *representativeness* and *availability,* described in the behavioural finance literature. This literature predicts, firstly, that high financial performance can cast a *'financial halo'* over a firm in the minds of decision makers, which they may 'mentally transfer' to their opinions about

other characteristics of the firm or its management. Secondly, behavioural finance suggests that enhanced familiarity with a firm from a larger set of information and research by analysts may increase the firms' *availability* in the minds of investors and decision makers in the capital markets and that this may also positively bias ratings given to firms by the respondents to the IR award surveys. On the basis of this, my thesis concludes that superior equity returns of small firms and higher exposure in security analyst' coverage appear to determine which firms are perceived to have the most effective IR programmes.

My research results also show that firms with effective IR do not earn future significant excess equity returns over the periods following the IR awards. This is contrary to the outcomes predicted by agency and information risk theories, which predict that effective IR should reduce information asymmetries and increase market values. However, my findings of insignificant future equity returns are consistent with those in some existing literature referred to above, that *prior* factors appear to influence some subjective ratings of firms in surveys but that the ratings are not necessarily associated with *future* superior financial performance.

Further, because I find that all firms deemed to have the most effective IR continue to attract higher analyst following over the periods following the IR awards, my research suggests that the continuity of information-intermediation activities of analysts may provide a critical link in the communications between firms and the wider market, and in fact may be a deciding factor for the degree to which a firm is regarded as having effective IR. This concept of firms gaining access to a 'virtuous circle of analyst coverage' is consistent with the opinions expressed during my discussions with IR managers (summarised in chapter 2). This is an expressed need for listed firms to "*manage the expectations*" of their analysts, which requires the maintenance of an on-going and two-way relationship, whereby management feel obliged to provide a consistent and reliable source of information for its analysts, which the analyst comes to at least expect to receive in future.

Finally, my findings show that the firms nominated for effective IR exhibit significantly increased equity trading activity and a reduced cost of equity capital over periods

following their nominations for the IR awards, indicating that high quality IR is directly associated with increased stock liquidity and with a lower cost of capital, as predicted by agency and information risk theories and also in accordance with findings in the existing empirical research.

1.6 Summary of research methodologies

My research methodologies, in summary, are as follows:

- Equity returns are tested using the Fama and French (1993) three-factor regression model, augmented by inclusion of the momentum factor..
- Cost of equity capital is tested using the Gordon and Gordon (1997) finite horizon dividend growth model.
- The volume of equity trading provides the basis for measuring liquidity, following Amihud, Mendelson and Lauterbach (1997).
- Analyst coverage is measured by the number of analysts publishing earnings forecasts in the *Thomson Financial FirstCall and* I/B/E/S databases, following a method established in existing research (e.g. Bhushan, 1989b).

1.7 Summary review of literature relating to security analysts

Because analyst' opinions and their proclivity to cover a firm are integral to this research, and because there has been much research suggesting that security analysts' and brokers' recommendations and reports may be biased, some of this research is described below. Firstly, some research in the 1990s found that the majority of US analysts' positive stock recommendations were for well-followed, high value shares and the overall ratio of buy to sell recommendations was disproportionately high (Womack, 1996). Whether this is still the case is an empirical matter but that partially motivated the substantially strengthened framework of industry regulation and law in the US and UK since this time, which is largely aimed at addressing the risk that analysts may be biased in this way, amongst other aims that I describe in chapter 2. However, even during the 1990s, there was still evidence that analysts played a vital role in the capital markets as key information intermediaries. For example, Holland (1998a) found, in interviews with executives and their largest shareholders, that meetings between analysts and firm executives

were then considered by both parties to be one of their most important channels of communication.

There is also research that shows why firms continue to appear concerned with their levels of analyst coverage. For example, the research of Walmsley, Yadav and Rees (1992) finds evidence of a significant positive impact on stock prices shortly after analyst-firm meetings, suggesting that the meetings are an important source of new information for investors using analysts' research. Also, other research finds that previously undervalued shares earn positive abnormal returns immediately after firms give presentations to their analysts and brokers and that the number of analyst' earnings forecasts for these firms also increases (Francis, Hanna and Philbrick, 1997).

This literature is relevant because my thesis employs a pure proxy to measure IR performance, compiled from ratings given by fund managers and by security analysts and buy-side brokers, who are the key intermediaries between listed firms and the capital markets and follows a methodology similar to that used in prior research (Botosan and Plumlee, 2002). This is a valid method for measuring the effectiveness of IR, because these ratings reflect the opinions of those who are also the main target audience of the IR function and who are therefore probably in the best position to judge how well an IR department has performed. This view is also supported by evidence. For example, Lang and Lundholm (1993) conducted seminal research on the relationship between firms' disclosure quality and analyst behaviour, finding a significant positive relationship between the disclosure ratings and levels of analyst following.

1.8 Theory

A full description of the theories upon which this thesis draws is in chapter 4. A summary of the two main areas of theory from which I draw is as follows:

1.8.1 Information risk theory and agency theory

Information risk theory and the closely related agency theory together provide a framework whereby the level of information asymmetry can directly influence market pricing. The role of IR is to provide information to the market and these theories

provide reasons to explain why, by providing higher quality information, more effective IR could reduce any stock price discount that equity investors associate with high information asymmetry and so whereby effective IR can reduce firms' cost of equity capital. Information risk theory is based on the tenets of the Efficient Markets Hypothesis (EMH), which defines the level of information efficiency in the capital markets by how quickly market prices move in reaction to new information (Fama, 1970) and there is a large body of empirical research using an 'event study' methodology to test the speed by which security prices react to news events. Several pricing 'anomalies' have been detected by this research that are not predicted in traditional finance valuation models, starting, probably, with Ball and Brown (1968), who found evidence of market inefficiencies in the form of post-earnings announcement price 'drift' reaction to bad earnings news in particular. Related to this, Barry and Brown (1985) find that stocks with higher 'information-risk', measured by the dispersion of analysts' earnings forecasts for the firms, is associated with higher required equity returns. Whilst these studies essentially involve a joint-test of both the specific model they employ and of the assumptions underlying the EMH, which may not actually be representative of the real mechanisms of the capital markets, they do show that there may be a direct relationship between the quality of a firm's communications and market prices.

Agency theory focuses on information asymmetry resulting from an inherent divergence in the interests of managers (the 'agent') and shareholders (the 'principal') due to a separation of the ownership and control of a firm. The theory predicts that more effective IR will reduce investors' expectations that managers will not necessarily act in their interests, and so reduce expected future agency costs for shareholders and result in a higher current share valuation and so a lower cost of equity capital. If more effective IR reduces perceived risk associated with the 'agency problem', there will be a positive impact on share price and a reduced cost of equity. Further relevant literature on these theories is described in section 4.1.

1.8.2 Behavioural finance

Behavioural finance provides a framework of theory to explain why some existing research finds that subjective ratings of firms given by analysts, fund managers and

peer firm executives appear to be primarily driven by prior factors such as high financial performance and high familiarity. Behavioural finance applies concepts from psychology to seek to understand how individual's underlying psychological preferences towards or away from these prior factors can influence their actual behaviours and judgements and result in observed systematic financial market reactions (Taffler, 2001). Some specific behavioural traits have been formally recognised in the seminal psychology literature (e.g. Tversky and Kahneman, 1974) that, it has been argued, can be directly applied to investors.

For example, research by Lang and Lundholm (1993) explores the relationship between firms' discretionary disclosure decisions and the firms' characteristics and their ratings given by the respondents in the US Association of Investment Management and Research (AIMR) survey on the quality of corporate communications, to which I refer above. Lang and Lundholm (1993) test the hypothesis that the ratings, which are aimed at measuring disclosure quality, are biased by the survey respondents' perceptions of other firm' characteristics and so are not necessarily a direct and accurate measure disclosure quality. They test for six potential explanatory characteristics, the size of equity returns, the magnitude of analyst earnings forecast error, firm size, equity return variability, the correlation between annual stock returns and earnings and, finally, the extent to which a firm is active in issuing securities. Lang and Lundholm find that analyst' ratings are positively correlated with firm size (market value), past earnings performance and with low equity returns variability, and are negatively related to the correlation between earnings and stock returns and that higher ratings are given to firms issuing more securities in the present or in future periods. The implication is that the ratings are biased by any of these factors. Although this paper does not refer explicitly to behavioural finance to explain these results, it is easy to apply some biases specified in the behavioural finance literature to understand how the respondents' biases to these other variables may affect the ratings they give in the AIMR survey.

Related concepts of importance to my research are described in other literature applying behavioural finance to help to understand the value of various published firm surveys for equity investors. Specifically, this literature addresses whether such

surveys contain valuable information for investors for investment decision-making. The over-whelming conclusion from this literature is that surveys of this type are of little value to investors as a guide for future returns and appear more to resemble a 'congratulatory slap on the back for a job well done' for the highly rated firms. This does not undermine my use of the *IR Magazine* survey to measure IR performance, because this survey merely provides the samples of firm with effective IR for my research tests and the number of nominations each firm receives provides a measure of IR effectiveness, which is a construct otherwise very difficult to objectively measure. Also, the prime aim of this existing literature, briefly described further below, was not to test the ability of surveys to accurately measuring a stated construct, but to test for the financial performance of the firms surrounding the time the survey was compiled.

Of the surveys tested by this literature, one is the well-known '*Most Admired Firms*' list, published annually by *Fortune Magazine* in the US and another is *Management Today's 'Britain's Most Admired Firms'* in the UK. Research testing the financial performance of firms rated in these surveys finds that, whilst with a paucity of adequate information from other sources investors might believe that stocks of firms lauded in such public surveys are also good future investments, the firms do not earn superior future equity returns (e.g. Agarwal, Brown and Taffler, 2004). These findings suggest that, instead of these surveys depicting 'winning' firms representing 'winning' investments for the future, they may merely provide a reflection of how the current opinions of analysts and investors have been biased by prior factors. A full review of the relevant behavioural finance literature is described in section 4.2.

1.9 Dissemination and future publications

- I have written a case study and accompanying teaching notes on Marconi plc for a Senior Investor Relations Master Class, held at Cranfield University in conjunction with the Investor Relations Society (IRS) in November 2001, titled "*They're Only Human – Understanding Fund Management and Investor Psychology*".
- Conferences I have attended and/or I have presented by research:
  - British Accounting Association (BAA) Conference, Jersey 2002

- Manchester Business School Doctoral Colloquium, April 2002
- Australian Academy of Management Annual Conference, November 2003
- Cranfield University Doctoral Colloquium May 2003 and January 2004
- Seminar on Corporate Disclosure, XFi, Exeter University, September 2004

- The UK Investor Relations Society (IRS), joint-sponsor of my research plan to publish extracts from my research.
- I have drafted a research paper based on my findings and I plan to submit this to *The Journal of Accounting & Economics, The Accounting Review, The Journal of Business Finance and Accounting and IR Magazine (US and UK).* This paper has been presented at the BAA Conference, Edinburgh 2005 (R. Taffler)

1.10 Organisation of this thesis

This thesis is organised as follows. Chapter 2 provides background information on the IR industry and on regulations governing the IR industry and the relevant regulations surrounding the capital markets and activities of security analysts. It also summarises discussions held at the commencement of this research with senior IR managers of some UK listed firms. In chapter 3 I review the relevant existing empirical literature on IR and chapter 4 explains the two main areas of theory I draw from. Chapter 5 explains how I develop my research hypotheses from the predictions made by these theories and from the relationships found in the empirical literature. Chapter 6 describes the research methodologies for constructing the samples of firms with effective IR, and the methods I use to test for any putative relationship between effective IR and equity returns, analyst coverage, equity trading volumes and cost of capital. Chapter 7 describes the research results and also contains the test result tables. Each of the research hypotheses are discussed in turn and the issues discussed in the final section of this chapter relate these findings to my research questions. Chapter 8 reviews my empirical results on factors that I find appear to be the 'determinants' and 'effects' of effective IR and the extent to which my findings compare and/or contrast with those in the key relevant existing literature. The final chapter is chapter 9, which reviews and concludes the thesis and raises some remaining unanswered questions and suggested areas for further research in this area. The final sections of the thesis hold the appendices and my references.

Chapter 2. Introduction to the IR Industry

Introduction

This chapter describes the context in which my research is set. Section 2.1 describes the IR industry, the varied role of the IR manager and the methods by which an IR manager can interact with the firm's investors and analysts in the capital markets information environment. Section 2.2 describes the regulatory and legal context surrounding the IR industry and in section 2.3 is a summary of discussions I held with the IR managers of six large UK listed firms and describes the issues that they consider to be of key and current importance in the IR industry.

2.1 The Investor Relations (IR) Industry

The development of the IR industry in the US and UK was primarily driven by a growth in the demand from multiple stakeholders for listed firms to supply them with an ever-increasing degree of information transparency and to be generally more accountable to their investors. The pressures on firms to do so is reflected in the following citation:

"*Everything we do, and the way we do it, has become a subject of dissection and analysis in the cockpit theatre of public opinion.*" (Lord John Brown, Group Chief Executive, BP plc, April 2004).

2.1.1 Defining IR

The US National Investor Relations Institute (NIRI) defines IR as:
"A corporate marketing activity, combining the disciplines of communications and finance, providing current and potential investors with an accurate portrayal of a firm's performance and prospects, therefore having a positive effect on total value relative to the overall market and the firm's cost of capital."

And, according to *Buchanan Communication/London Stock Exchange, Investor Relations: a practical guide* (2004), *"IR encompasses the broad range of activities through which a quoted firm communicates with its current and potential investors."* 'Effective IR' is defined in this publication as "*designed to achieve a fair market valuation for the firm, easier and cheaper access to capital in the future, a*

reasonable level of liquidity in its shares and a strong group of supporters and believers." IR therefore has a wide remit but is centred on the how the perception of the firm in the market affects the value of its equity.

2.1.2 The 'fair market value'

Probably the most important element of any IR programme is ensuring that the market is informed of events that may influence the market price of a share, i.e. of any price sensitive information (PSI), which if not released to the market, as well as potentially incurring regulatory action, may mean that the stock is not 'fairly valued'. A stock may be said to be 'fairly' valued when its price accurately and correctly reflects current market' expectations of the stock's future the cash flows. However, the formation of these expectations depends upon receiving sufficient, accurate and up-to-date information about current and future events likely to affect the firms' future cash flows.

Because some shareholders invest primarily for short-term gains and others may look for longer-term capital growth or a longer-term income stream, the type and the form of information that each requires will probably reflect these individual investment styles. However, regardless of investment style, the magnitude of a firm's capital costs affects both the long-term and short-term returns available to all investors.

IR is a continuous and on-going process of communication and not a short-term effort to raise the share price as high as possible. Attempts to do so may only be short-lived and are probably illegal. In addition, if a firm has this aim and fails to live up to expectations the share price may be punished severely, more likely to result in a depleted share price and a long struggle to win back the trust of the market. An example of the importance of winning investors' trust are the recent re-assessments of oil reserves by Royal Dutch Shell, which have probably severely affected not only its share price but also the longer-term reputation of its management.

However, it is not hard to see why the level of the share price is very important to listed firms, because misunderstandings over, or poor interpretation of, the

fundamental value of a business can lead to difficulties in raising equity finance in the future and to increased vulnerability to hostile takeovers.

2.1.3 An effective IR officer (IRO)

IR is not in fact a bona fide 'profession' and an IR manager is normally qualified only by experience, gained either within a business or from exposure to the workings of the information environment in a related role. Again according to *Buchanan Communication/London Stock Exchange, Investor Relations: a practical guide* (2004), an effective IR officer requires good business and industry knowledge, but is also required to have the communication skills and an ability to effectively convey that knowledge to the market through a range of channels and by using up-to-date communication technologies. Therefore IR straddles a range of disciplines, although it is normally located in a firm's finance function because it requires a thorough understanding of financial reporting regulations and close contact with up-to-date financial performance of the firm.

IR is also not a one-way flow of communications from the firm to the market, because by interacting with the market the IR manager can also provide senior management with invaluable feedback on how they and the firm are perceived in the financial community. Therefore, perhaps most importantly, the effective IR manager must develop good personal relationships with both his own senior managers and with key investors and analysts. In fact, the IR manager at Unilever plc states that "*Investors can't value what they can't see – a successful IR programme requires transparency, the ability to bring business performance to life and clarity in communication. It must be underpinned by the highest standards of corporate behaviour.*" – IR manager, Unilever plc; winner of the Grand Prix for Best Overall Investor Relations, *IR Magazine* UK IR Awards Report 2003.

2.1.4 Measuring IR performance

It is difficult to quantify the success of an IR programme since stock prices, stock trading levels and levels of analyst following are influenced by a wide range of factors that are all acting at the same time, and in which IR probably only plays a part. However, faced with a limited, although sometimes substantial, cost budget it

is not surprising that firms want to measure the success of their IR programmes. Methods that are often used to measure IR performance include:

- Analysing the ease with which equity capital is raised and the relative cost of raising it, which is sometimes referred to as the 'litmus' test for IR success;
- Monitoring how the shareholder register changes over time in line with management's desired shareholder-profile;
- Assessing any improvements in the financial community's understanding of the firm's 'story', from feedback obtained during fund manager and analyst meetings;
- Recording the number of times the firm is nominated and wins IR and other industry awards;
- Monitoring the number of analysts and institutions visited in a year;
- Monitoring the level of analyst coverage over time;
- From informal commentary and feedback from various capital market audiences.

(source: a summary of guidance on the US National Investor Relations Institute (NIRI) website, http://www.niri.org/)

2.1.5 The growing practice of IR'

IR is a growing industry. Some evidence of the growth in the importance placed by both investors and firms on IR is seen in the findings of the *Thomson Financial Extel Pan European Survey (2004),* in which 1,007 fund managers, 155 brokerage firms and senior managers of 298 of Europe's largest listed firms identify three key trends:

1. IR contact with buy-side analysts compared to sell-side analysts has increased, is increasing and will increase further. This direct contact with the buy-side is also more frequent, more sophisticated and considered more essential for effective investor relations.
2. The priority placed on the IR function by firms has grown, giving the IR role and responsibilities a higher internal profile, in some cases involving Board representation and making it more central to the firm's on-going procedures and integral to the firm's finance functions and processes.
3. Both firms and IR practitioners are still looking for independent, rigorous and recognised methods of 'rating' IR performance to benchmark their performance with peers, to enhance and what they do and to publicise their IR achievements.

2.1.6 The audiences and contacts of IR

An IR programme traditionally focused on four main external audiences: institutional investors, private investors, the financial media and security analysts (Buchanan Communications & London Stock Exchange, 2004). But the responsibilities of IR now normally extend to a wider group of stakeholders, such as lobby groups, local communities and environmental activists, driven by a more recent trend towards socially responsible investing (SRI) and corporate social responsibility (CSR) for example. This expansion in the IR remit is reflected by an extract from *FinanceTalking.com*, a web site dedicated to financial public relations and investor relations: *"Investor Relations and financial public relations concern the many ways that a firm communicates with those who have a financial interest in the firm. The prime audiences for most firms will be investors, potential investors and those who influence them. However, financial communications also impacts on other stakeholders such as customers and suppliers, banks, Governments and employees* (July, 2004*).*

The main audiences of IR are more fully described below.

2.1.6.1. Financial institutions

Also referred to as the 'buy-side', this term covers a wide range of professional investors and financial institutions, including life assurance firms, insurance firms, pension funds, unit trusts, investment trusts and other funds and investment management groups who manage money on their own behalf or on behalf of another fund. A more recent type of institutional investor is the hedge fund, which uses a different form of investment strategy from traditional investment firms. The strategy of most hedge funds is to profit from speculating against short-term stock market movements, which makes it difficult for a firm to assess whether they are moving into or out of their stock. However, hedge fund managers are likely to expect to receive the same level of information from a firm as does any other institutional shareholder.

Financial institutions normally maintain close and direct contact with the firms in which they invest, through company presentations and meetings, to which analysts are often also invited, as well as on the telephone and by email. This need for a

regular flow of information means that the IR manager must ensure that senior management are made available at key times.

A firm's investors may also be located overseas. However the Internet and web-based communications are now widely used to disseminate corporate results and news on a global and immediate basis to all investors equally, which as well as saving the time of senior managers by reducing the need for personal presentations and visits, assist a firm in meeting more recent legislation requiring equal and unbiased dissemination of events that may affect the stock price (see section 2.2 for a review of this legislation).

2.1.6.2. Retail investors

Despite declining in number since a peak before the 1990s, retail or private investors continue to represent an important element of many firms' investor-profiles and they are probably a particularly important source of finance for the smaller quoted firms, who may struggle to attract financial institutions into their stock. Also, although the overall percentage of equity held by retail investors remains small, because they may out-number a firm's institutional investors, they can be a more time-consuming audience for information from an IR department.

However, private investors can be a more loyal group of shareholders than institutions and may hold stock for longer periods of time, because trading is often less easy and more costly for them compared to professional investors. Because they will generally not have access to broker research, private investors must rely on media comment and direct contact with firms or the advise of a bank, broker or other representative. Therefore effective communications between a firm and a few major private client brokers could be a more efficient way of communicating a large number of private investors, via pro-forma data packs sent to a few key regional brokers. Finally, a firm's own employees are also often shareholders, in company share option schemes and other share schemes, and represent an IR audience with their own unique information requirements (source: Buchanan Communications & London Stock Exchange, 2004).

2.1.6.3. Security analysts

There are two main types of analyst; sell-side and buy-side. Although their roles are broadly similar, their information needs are different.

Sell-side:

These analysts and brokers tend to have an expert knowledge of a specific industry sector or geographical region. One of their key roles is to publish research based on publicly available information and any other information obtained directly from a firm. They generally make their research publicly available for the use of both institutional and private investors when making investment decisions. Although they are likely to request regular access to senior management at the firms they follow, they cannot be granted any information advantage over other audiences because the provision of price-sensitive information incurs serious penalties from the UK Financial Services Authority (FSA) and US Securities and Exchange Commission (SEC), the respective industry regulating bodies. However, because their opinions can have a significant impact on the buying and selling of large tranches of stock by institutions, sell-side analysts are a key target audience for IR practitioners

Buy-side:

Buy-side analysts are employed by financial institutions and the past few years has seen a growth in their number, as institutions have sought to produce their own research rather than rely on research from the sell-side. This is probably because of a heightened awareness of the risk of conflicts of interest surrounding sell-side research. Because their research is not made available outside their own institution, it is normally tailored to the institution's investment style and sector/geographical preferences. However, a buy-side analyst is as likely as the sell-side to request meetings with the IR personnel or senior managers, and to have a similar access to company information for use by his employing investing institution (Buchanan Communications & London Stock Exchange, 2004).

2.1.6.4. Financial media

Use of an eager group of financial journalists is an effective method for disseminating information to a wide audience, and also the establishment of good relationships with financial journalists, can be crucial to ensuring that a firm's 'story' is portrayed accurately and in a timely way. Wide media coverage can also sway the

opinions of institutional and private investors who read, see or hear compelling media comment and/or 'stories'. Relationships with the media may sometimes be mediated by financial PR firms, who advise on developing relationships with journalists and sell-side analysts and give strategy advice for gaining press coverage (Buchanan Communications & London Stock Exchange, 2004).

2.1.6.5. Other stakeholders

The IR function is also required to provide information to may other external parties, including corporate financial advisors at merchant banks, independent financial advisors, lending institutions, brokers from smaller broking houses, IR consultants, firm registrars, legal advisors, primary information providers (P.I.P.), industry regulators and government bodies, and even the firm's auditors and the financial designers and printers who may be used to produce financial literature (Buchanan Communications & London Stock Exchange, 2004).

In summary, this section has described the wide-ranging role and responsibilities of IR and in the following section I review 'best practice IR' and the main IR industry regulations.

2.2 Regulation and the Best Practice IR

2.2.1 Best practice IR

Although best practice IR naturally incorporates compliance with all relevant laws and regulations, this probably represents a minimum threshold of IR performance. 'Best practice IR' is defined by meeting the requirements of regulations but also largely by what the market has come to expect, which means that best practice IR is a constantly changing concept. For example, five years ago it was still common for firms to invite analysts to a closed, one-to-one results presentation and pay little regard to the information advantage that this gave the professional investment community over private investors. Today such an approach is likely to be viewed as selective disclosure and is prohibited in the US by Regulation Fair Disclosure (Reg. F.D.) and by similar legislation introduced by the UK Financial Services Authority (FSA), which are both described below.

IR per se is not yet itself a regulated industry. However, in a recent study of IR practice by European quoted firms, Marston (2004) finds that most company executives, whilst not seeing a need for greater regulation of IR, are in favour of the profession itself formulating international IR best practice guidelines rather than relying on local guidelines issued by the national stock exchanges and local investor relations societies. To this effect, the UK Investor Relations Society (IRS) launched the first recognised *Certificate in Investor Relations* in 2003, with the aim of establishing a minimum level of knowledge for UK IR managers, although to date it appears that take-up has been slow, probably because its introduction lags the establishment of a dedicated IR function in most quoted firms in the US and UK.

2.2.2 Regulation

It is important to understand the wealth of laws and regulations governing the disclosures made by listed firms in the UK and US, in order to appreciate the high standards in communications that is now expected beyond meeting traditional financial reporting requirements. As noted above, although the practice of IR is not itself regulated, corporate communications are subject to a large and growing range of regulations, with which IR personnel must remain up-to-date in order avoid regulatory penalties, but also to continue to meet the high information-expectations of the market.

In the UK the main legislation and regulations include various Company Law Acts, the Financial Services and Markets Act (FSMA), the Takeover Code, AIM rules, the UK Listing Rules and the corporate governance Combined Code and New Combined Code. Firms should also keep informed about, and comply with, other guidance and requirements from the Department of Trade and Industry (DTI) and the Financial Services Authority (FSA). There are also a number of European directives that have an impact on UK IR Best Practice and if a firm has an overseas listing, then local regulations must also be met. In the wake of the 'Enron Era' corporate governance initiatives are probably near the top of the regulatory agenda and there are a number of on-going debates about issues such as the independence of directors and auditors. The Combined Code on Corporate Governance was revised in July 2003 to take into account the Higgs Report on non-executive directors and the Smith

Report on audit committees and the European Commission are also currently finalising their Transparency Directive that will apply to all European firms equally.

2.2.2.1 Regulation Fair Disclosure (Reg. F.D.)

Introduced by the US Securities and Exchange Commission (SEC) in October 2000, Reg. F.D. has had a significant impact on IR across the globe, although it technically only applies to US-listed firms. In short, this legislation governs how firms communicate with their analysts. It is an attempt to eliminate so-called 'selective disclosures', by which firms formerly gave advance or 'closed' briefings to select institutional investors and analysts. US-listed firms are now required to widely disseminate the same level of information as disclosed during such briefings with the financial community.

Reg. F.D is actually hardly more onerous than the UK market's long-standing requirements on disclosure, but it reflects the high expectations of market regulators and its introduction was very widely debated and discussed in the corporate communications community. It has also led a move towards a wider use of corporate websites for communicating with investors, because in order to meet its requirements firms have used Internet technologies to give equal access to the same information to all investors at the same time.

The longer-term effect of how firms' communication policies are affected by Reg. F.D. remains to be seen, but some research has already been conducted that attempts to measure its impact. For example, Mohanram (2002) tests how Reg. F.D. has affected the accuracy of analyst' earnings forecasts and finds that absolute forecast error and forecast dispersion have increased since it was released, perhaps providing preliminary evidence that firms now are less-forthcoming when communicating with analysts compared to prior to Reg. F.D.. Any resulting reduction in firms' transparency lies behind some criticisms raised in the IR industry and financial media, that corporate communications, especially in the US, is now over-regulated and that the legislation may have 'back-fired' because it tends to encourage firms to be over cautious in their external communications and to result in a reduction in the quality of information in the market (*IR Magazine*, August 2004).

2.2.2.2 The Myners Report

In the 2000 UK budget, the Government made clear its concern that there may be factors encouraging institutional investors to follow industry-standard investment patterns that focus overwhelmingly on large-firm equities and gilts and avoid investing in small and medium-sized enterprises and other smaller firms. It therefore commissioned Paul Myners, the chairman of *Gartmore Investment Management*, to conduct a thorough review of the investment banking industry and to consider whether there were such factors distorting the investment decision-making of institutions. The resulting Myners Report represents a UK industry milestone because, although the report essentially veered away from imposing strict and obligatory requirements, it probably marks the start of a recent more interventionist regulatory environment surrounding the investment industry in the UK than had existed previously. The stated purpose of the review was: "... *as a legitimate issue of policy concern, to establish the extent to which institutions' approaches to investment decisions are rational, well-informed, subject to the correct incentives and as far as possible, undistorted*". The Myners Report, published in March 2001, made some detailed and focused suggestions for structural and policy changes for UK financial institutions that are beyond the scope of this thesis. However, Paul Myners summarised the report as follows:

"The problems the review describes are complex. They are essentially to do with incentives and behaviour. Diagnosis of such problems is easier than cure. I do make a number of suggestions ... but I do not suggest that these alone are enough . Further change is needed. My strong preference, however, is for the industry – if it is willing – to drive change forward itself. Legislation, though it might in the end prove necessary, is likely to be a blunt instrument to tackle the kinds of problem I have described. The approach I have in mind is consciously based on the precedent of the Combined Code of the Committee on Corporate Governance and the various codes that preceded it. On any reasonable analysis, these codes have done their job. I believe it should be possible to apply a parallel approach to pension funds and other institutional investors, and that such an approach could be a proportionate response to the problems the review describes".

2.2.2.3 The UK Financial Services and Market Act (FSMA)

This major piece of UK legislation came into force in December 2001. It lays down new rules on market abuse and updated the FSA's Price-Sensitive Information (PSI) Guide. Both of these Acts address the issue of 'selective disclosure' of information and are therefore crucial to IR.

Market Abuse:

The FSMA increases the likelihood of prosecutions for market abuse by introducing a new civil offence to supplement the existing criminal offence of insider dealing. This means that the FSA need now only show that the 'balance of probability' points to an offence having been committed rather than proving 'beyond reasonable doubt' that is required for a criminal prosecution. The new civil offences for market abuse are:

- 'Misuse of information', which is broadly equivalent to the former insider dealing offence;
- Creating a false or misleading impression relating to the disclosure of information;
- 'Market distortion', whereby actions and behaviours relating to the disclosure of information may distort the market.

Price Sensitive Information (PSI) Guide:

The up-dated PSI Guide by the UK Listing Authority (UKLA) defines PSI as "*Information that may, or would be likely to, lead to a substantial movement in the price of a firm's shares*". However, it is largely left to firms and their legal advisors to interpret this. The key points of the new PSI Guide are as follows:

- Briefings to analysts should be also be made available to the public;
- Analysts should not be given any preferential treatment in the release of PSI;
- Firms should review their procedures for meetings with analysts to ensure that no PSI is revealed;
- Firms are encouraged to publish information over the Internet but should not view putting it on their website as necessarily equivalent to wide dissemination to the market. PSI must also be sent to the market via an approved news service (called Primary Information Providers or P.I.P.'s).

2.2.2.4 The 'Global Settlement'

In 2003 New York Attorney General, Eliot Spitzer, lead an investigation into the internal controls in place at major US investment banks to control their internal 'Chinese walls' between their sell-side analyst and corporate broking departments and how well these controls address any potential conflicts of interest. This action was prompted by the discovery of internal e-mails in which some analysts privately derided firms for which they were issuing very favourable research reports. The immediate outcome of this investigation was a landmark fine for ten US Wall Street investment banks of $1.4 bn. (£760m) for their failure to adequately control the activities of analysts, referred to infamously as the 'Global Settlement'. This settlement came with new obligatory guidelines governing internal control environments at all US investment banks. A summary of these, as far as they are relevant, is as follows:

- There is now a prohibition on any activities by analysts that could be seen as "spinning" of a new share flotation or initial public offerings.
- The investment banks must take, and be seen to be taking, measures to minimise the contact between internal research and investment banking functions.
- Analysts are prohibited from being paid for research by the investment banking arms and are prohibited from attending corporate finance 'pitches and road shows' to attract business.
- Investment banks must provide retail investors with independent investment advice. For a five-year period each investment bank must *"contract with no less than three independent research firms that will provide research to the brokerage firm's customers"* and regulators with appoint an independent monitor for each firm.
- Each firm must publish its analysts' recommendations and price target forecasts so analysts' performance can be compared.

In the wake of this action in the US, in 2003 the UK Financial Services Authority (FSA) warned that it would also investigate any alleged malpractice by UK investment banks with regard to their internal controls over analysts. However the FSA stopped short of imposing the prescriptive set of 'rules' adopted in the US,

instead putting the onus on the banks to 'self-police' any internal conflict of interests, leaving the banks more flexibility to instigate their own internal control systems.

Since this time, the FSA has actively monitored internal changes made by the UK investment banks and, as it has not yet issued further guidance or taken more strict action, it appears satisfied with any changes that have been put in place. However, in March 2004 the FSA did set a dead-line for UK investment banks to have developed and reported on measures taken to prevent potential analyst' conflicts of interest by July 1. It also recommended that analysts be prohibited from attending investment bank road shows with potential clients and that failure to provide evidence that they were taking satisfactory action would prompt the FSA to enforce more prescriptive action and to enforce heavy fines for contraventions. Again the longer-term impacts of these actions, and whether any further action is to be taken by the UK FSA and the US SEC, remain to be seen. However, the overall result of these regulatory changes and a new environment of increasingly sceptical investors may mean that any cause of sell-side analyst bias that was present prior to 2003 is at least now minimised. Meanwhile, probably as a direct result of these events, there has been a consolidation of the sell-side analyst industry in both the UK and US that has resulted in an overall reduction in number of sell-side analysts, as institutions are increasingly relying more on their own in-house brokers for research and information or using research from independent research analysts (*IR Magazine, August 2004).*

2.2.2.5 US Sarbanes-Oxley Act 2003

The *Sarbanes-Oxley Act* (referred to as '*SOX*') applies to all firms listed in the US and even to foreign subsidiaries of US listed firms, although some exemptions have been granted for non-US domiciled firms listed in the US. However the ramifications of SOX have probably extended beyond just the US, because market regulators in many other countries have since introduced similar rules. SOX is wide ranging but overall requires firms to comply with several new and enhanced internal control procedures, along with controversial new requirements that directors personally 'sign off' on the adequacy of these controls in the firm's annual report, thus potentially exposing them to future liabilities should any legal action be taken on the grounds that any information they contain are misleading or falsely stated.

2.2.2.6 Corporate governance

In 2002 the UK Government commissioned the *Smith Higgs Report* to look into the current role and the effectiveness of corporate governance procedures of the Board of directors and non-executive directors and to make recommendations on how to improve the accountability of the Board to shareholders and on methods to improve the effectiveness of their systems of internal controls. This lead to new legislation enshrined in the Combined Code on Corporate Governance, which was up-dated in 2003 in a New Combined Code, applying to all UK listed firms with a financial year ending after 1 November 2003. The aim of the Code is to bring about "*greater transparency and accountability in the board room, formal performance appraisal and closer relationships between non-executive directors and shareholders".* The Code made a series of recommendations on improvements to Board constituents, remuneration, procedures and committees and the relationship between the Board and the Audit Committee. Companies are also required to state compliance or non-compliance with the Code and to explain reasons for non-compliance. Although the main proposals in the New Code only apply to the largest firms because some were relaxed for smaller quoted firms in certain areas (for example, firms outside the FTSE 350 need not have at least half their board composed of non-executive directors if they have at least two non-executives), this legislation marked a significant advance in the transparency by which UK directors operate

2.2.2.7 European legislation

There are currently several EU Directives being finalised that aim to harmonise the European financial services sector. The main new and most relevant legislation is that in 2005 all firms must comply with International Financial Reporting Standards (IFRS), so that for the first time all European firms will be required to report in a consistent and comparable format.

Other European legislation that is currently under review includes:

- The Market Transparency Directive, which is aimed at increasing the transparency of information released by security issuers that are listed in a regulated market. This will require that issuers produce an annual financial report within three months of the end of the financial year, a detailed semi-annual

financial report and quarterly financial information for the first and third quarters of each financial year.

- The Prospectus Directive, which requires that a prospectus, once approved by the home country authority, be accepted throughout the EU prior to the public offering and/or admission to trading in a regulated market.

2.2.2.8 Corporate social responsibility (CSR)

CSR reporting has become increasingly important to firms in the past few years. CSR has a range of definitions, but is probably best described as the way in which a firm manages the impact of its business on society and the environment. The communication of how firms are acting in a CSR responsible fashion, by managing the risks associated with poor environmental, ethical or social performance, is now recognised as one of the factors that can attract their consumers and investors to invest in the firm and the responsibility for CSR normally lies in the IR function.

2.2.3 Section summary

This concludes the section on the IR industry, which describes the context in which this thesis is set. It explains the many responsibilities involved in the role of IR and the growing range of industry regulation governing the information environment in which listed firms now operate. The next section provides a summary of some discussions held with six leading UK IR managers at the start of my research program. This provides rich information on how IR managers currently see their roles and the main issues they perceive to be affecting the practice of IR and which further illustrates the context of my research.

2.3. Discussions with IR Managers

2.3.1 Aim of the discussions

The aim of these informal discussions was to gain a better understanding of the role of an IR manager and the context in which they operate. The outcome of the discussions is an up-to-date perspective of IR, which shows the 'added-value' that the specialised role of IR can provide in addition to more traditional and formal corporate communication methods, to which investors where restricted to prior to formation of dedicated corporate communication departments by listed firms. The

discussions were structured, so that the respondents discussed specific issues relating to the IR industry that are probably the most currently salient. IR managers at the following firms were interviewed, on the following dates:

Firm Name	**Date**
Hoare Govett/ABNAMRO	18 January 2002
Colt Telecom plc	25 January 2002
BAE Systems plc	31 January 2002
BP plc	31 January 2002
CGNU plc	30 January 2002
Barclays plc	21 February 2002

2.3.2 Respondent comments

The discussions were organised under the main headings shown in bold below and are a summary of the comments made by the IR managers.

The attributes of an effective IR manager

- The key attributes of an effective IR manager are in "*being proactive, approachable, honest and responding to questions quickly*" and in "*telling the truth, without exaggerations or false promises*".

- Possessing good communication skills is probably more important than having personal experience of working in the firm's business and industry.

- It is useful for an IR manager to have experience "*from the other side of the desk*", by which they mean to have had a role as a security analyst or fund manager, to gain first hand knowledge of the type and form of information that analysts and investors require. This also helps to understand how the market can "*tar firms in the same sector with the same brush*" and to be better able to anticipate how events that impact a competitor firm may affect one's own share price. This brings an understanding of the importance of differentiating your firm from others, in order to minimise any negative effects from industry index price movements.

Internal organisation and communications

- The effectiveness of a firm's internal communication systems is equally as important as that of its external communications, because the quality of the IR 'message' relies on receiving accurate and up-to-date information from other functional areas of the firm. This is important because the perceived level of performance of an IR function relies largely on how effectively internal communications flow within a business, even though this is normally beyond the remit or control of the IR department itself.

- The IR manager is the 'mouthpiece' of the firm, but investors also obtain information from many other sources. This means that it is vital that information that the market hears from different sources are consistent and do not contradict. The IR manager should be the first to communicate any price-sensitive information to the market and direct access and input from the chief executive is considered vital for this and to ensure that investors' and analysts' enquiries are answered quickly, yet accurately.

Communication methods

- IR managers are aware that institutional investors and sell-side analysts prefer to meet in person so they are able to influence the agenda of discussion on issues about which they are particularly concerned. It is important that during these meetings the IR manager gives some form of response to all questions that are asked even if the questions are not directly answered, in the interests of not revealing competitive advantages or in not releasing new price-sensitive information (PSI). Any PSI that is revealed during these meetings must then be immediately released to the market via an authorised Primary Information Provider (PIP) that is authorised by the UK Financial Services Authority (FSA), such as on the UK Regulatory News Service (RNS), or by the SEC, the equivalent US authority.

- New technologies, especially the Internet, have made it easier for firms to communicate more widely, efficiently and quickly but have at the same time raised the information-expectations of the market. Despite this, telephone

contact is still considered to be the 'best' method for frequent communication and for maintaining a good relationship with analysts and investors because electronic communications are considered to lack the same personal element and to be inadequate for capturing 'nuances' that voice contact provides.

- There is no general 'rule' about how regular interim formal announcements should be made, but they are generally more frequent for a business with highly fluctuating earnings or cash flow, or for a firm operating in a high risk or high profile industry, such as defence and insurance firms.

Focusing on the shareholder profile

- Each firm has a unique mix of type of investor, whether institutional versus retail or domestic versus overseas but, in general, retail and private shareholders are seen to present more of a "*nuisance*" for the IR manager, in terms of the higher number of information requests they make. Also, the frequency and form of information that each investor requires depends on their individual investment time horizons.

- It is important to know the particular investment style of your largest shareholders, because some investors are subject to a higher degree of trading 'inertia' than others. Some investors may be reluctant to sell or buy large shareholdings, partly to avoid significantly impacting the stock price, but perhaps also to avoid any additional reporting requirements that come for shareholdings over 3%. Fund managers may also be subject to internal operational risk management policies and internal controls and to the investment remit of the fund. This can mean that they maintain commitments to specific firms over the long term, whereas smaller 'boutique' funds and hedge funds are often more active traders and have a shorter-term investing time horizon.

- It is important to focus communication efforts on the current or 'target' institutional investors, so that the firm's executives can more efficiently use their time on meeting with the investors that they are concerned to maintain or increase in weighting.

- Increasingly IR managers are required to meet the information needs of multiple firm stakeholders, including customers, Government bodies and lobby groups, who may all also be investors in the firm. In this way the IR department manages the overall 'corporate reputation' in the eyes of many stakeholders. If a firm has a high percentage of foreign ownership, the IR manager is also required to have knowledge of any global issues affecting investors and to appreciate that communications to overseas investors should be no less effective than with local investors, although this is facilitated by technologies such as email, conference calls and web-casts.

Managing 'good and bad' news and crisis management

- The communication of both good and bad news is about "*managing market expectations"* and whether the news is good or bad, "*honesty is the best policy*". The firm should consistently balance the tone of the 'message' it presents between optimism and enthusiasm, even when conveying negative news.

- Although IR managers consider that any 'bad news' travels faster than does good news, they consider that adopting an internal and external policy of at least quarterly reporting makes it easier to bring the market back in line with the firm's intrinsic current value.

- It is important to put the '*best light'* on any bad news, by giving clear information on the context of the news and to provide any mitigating factors and contingency plans that are being put in place to correct any controllable issues. Generally, bad 'surprises' are always to be avoided but, when there is bad news, it is better be provide accurate information the first time it is reported or otherwise risk an impression of uncertainty and lack of business knowledge.

Credibility

- Having credibility is regarded as "do*ing what you told the market you planned to do*" and is regarded as a fundamental attribute when communicating with sophisticated investors and analysts, who themselves may be already very highly knowledgeable. An IR manger has higher credibility if she/he has obvious in-

depth industry knowledge, as well as knowledge about the current state of the equity markets, and also by maintaining effective contacts to the informal industry 'gossip' and rumour channels from third party sources and also by forming good personal contacts with key individuals in peer firms and with analysts and fund managers.

- Credibility incorporates a complex mixture of 'hard' aspects (accurate and detailed and focused information) and 'soft' aspects, such as a feeling of trust and integrity and from having a record of delivering on former 'promises'. Analysts and fund managers have a long memory in regard to executives who have lost credibility as a result of frequent or dramatic past earnings or dividend 'surprises' or if they make apparent strategic decisions or make business changes about which the market has not been adequately warned.

- Having confident and lively presentation skills and an enthusiasm about the business also assist in adding to the degree of credibility. The IR function is more credible if the IR manager has the business "*in his blood*", perhaps from having risen up from a middle-management role in the firm or of a similar firm.

- Information obtained directly from a CEO is viewed as more credible than from the IR manager himself, although investors will be aware from past experience of the degree of proximity in the relationship between the CEO and the IR manager and about the IR manager's ability to have access is fast and accurate information from the business areas. One respondent said, "*A measure of credibility is how often the CEO speaks directly to the market*".

- Credibility depends upon the reputation of particular individuals and can only established over a period of time. It comes from reliability and consistency, of the firm's message ("*the worst 'sin' is to appear uncertain or to change the message*"), of accounting methods (because a change may appear to be accounting 'manipulation') and also consistency in the nature of business. The restructuring of a business may require analysts to adjust their valuation models

and fund managers may need to reassess their portfolios to meet required risk levels, which are both time-consuming.

IR performance measures

- The main method used by IR managers to gauge their IR performance is to regularly benchmark to the IR performance of peers, because the level of disclosure expected by the market and IR best practice is largely determined by what the majority of firms actually do. Other methods include measuring the effect of company announcements and presentations on the P/E ratio, measuring the degree of analyst' earnings forecast consensus and how close this is to the firm's internal earnings forecasts or even in the winning or nomination in industry awards or rankings. More informal methods for measuring IR performance include informal feedback from analysts and investors and the tone of media coverage of, and reaction to, company events.

Views on industry regulation

- IR managers regard the main impact on their role from the FSA regulations to be over the communication of information likely to have a material impact on the share price. This is not assisted by a large degree of subjectivity in the phraseology of the FSA regulations, which does not precisely define the concept of 'materiality'. Firms must therefore be proactive and sometimes be over-cautious in their communications, to ensure they are acting within the law.

- The increase in the number of regulations to which firms must comply over the past few years has generally caused some firms to be less forthcoming beyond making formal announcements. This is to avoid releasing 'misleading' information or making selective disclosures in meetings with investors and analysts. Also, formal announcements have probably become more lengthy and comprehensive, because no selective information can later be discussed or divulged during analyst meetings if the firm has not previously released the same information.

- The recent FSA rules have probably resulted more in an increase in the range of communications channels used rather than in affecting the actual communication

content, due to the requirement to release information to the whole market at once and not to give preference to any select parties.

- Firms are not strictly permitted to issue any guidance to analysts for the process of forecasting future earnings, but some IR managers feel they are able to at least question an analyst on the size of their earnings forecast if they appear to be 'outliers' compared to market consensus.

- The role of the FSA is viewed as "*keeping firms on their toes*" and the UK regulations as being more effective compared to the more restrictive framework in the US. The firm's relationship with the FSA is simply viewed in the same manner as its relationship with another external stakeholder. The longer-term impact of the FSA regulations can only be judged in hindsight, and as the market experiences the degree of severity by which they are enforced and how often they are enforced over the coming years.

- Firms operating in the service sectors perhaps face an additional corporate governance responsibility, because most other businesses and society at large are perhaps entirely dependent on their operations (for example, energy and defence services, telecommunications and to a large degree the financial services industry, in which the public entrust their savings).

Summary

This chapter has provided an overview of the IR industry and the context within which my thesis is located. In particular, it has described the diverse and complex role of the IR manager, which involves communicating effectively in different media and to a widely disparate audience, within a growing framework of regulations and guidance. In the following chapter I review the existing empirical literature relevant to this thesis.

Chapter 3. Literature Review

Introduction

Whilst the previous chapter provides background information about the IR industry and the regulatory environment surrounding the practice of IR, this chapter reviews the relevant empirical literature on the relationships between effective IR and equity returns, analyst coverage, stock liquidity and the cost of equity capital.

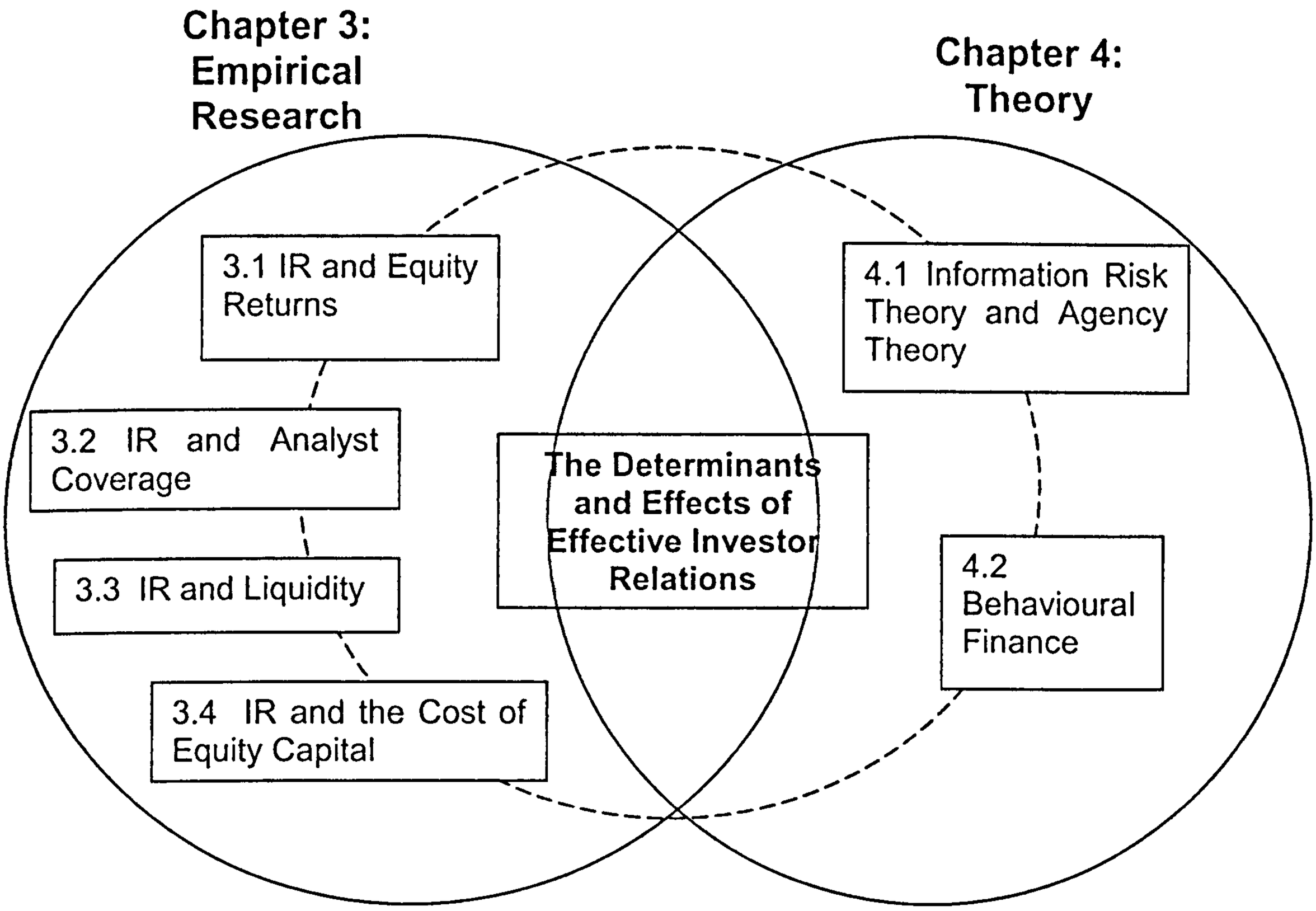
Literature Review Methodology

The body of literature that is relevant to my thesis is quite broad, so I divide my literature review into the following four areas:

3.1. IR and Equity Returns
3.2. IR and Analyst Coverage
3.3. IR and Equity Trading Volumes
3.4. IR and the Cost of Equity Capital

This review of the empirical literature leads into chapter 4, in which I describe information risk theory, agency theory and behavioural finance. Together, the relevant empirical literature and these three areas of theory provide the framework that drives the hypotheses that I test in my thesis and that I lay out in chapter 5.

The following diagram illustrates the overall structure of how the empirical literature and theory support my research hypotheses:



3.1 IR and Equity Returns

This section reviews the existing literature on the relationship between effective IR and equity returns.

3.1.1 Introduction

There are strong theoretical and intuitive reasons to expect to find a relationship between effective IR and improved equity performance. The theories relating to this relationship are described fully in chapter 4. This section explores the empirical evidence from prior research that tests this proposed relationship.

3.1.2 The literature

As described in chapter 2, the IR industry is in the wake of some notable accounting 'scandals' and events that have raised concerns over conflicts of interest within investment banks, which together have largely motivated a rise in institutional shareholder activism and also lead to the formation of a new strengthened framework of regulation in both the US and UK.

Over the past decade or so, such events have also encouraged a substantial growth in the number of IR service providers and in the level of expenditure by firms on IR in order to provide the market with information on how they are managing risks relating to these issues. This general growth in the importance of external corporate communications is presumably based on an assumption that improved IR will bring benefits to investors and to the workings of the capital markets in general that come from stock prices that better reflect 'fundamental values'. In this section of my thesis I review some research that provides some evidence to support these assumptions.

Firstly, some industry studies claim to provide evidence that firms can reap direct cost of equity and share price benefits from improved corporate communications. A survey by *Standard & Poors (S&P)* ranks the transparency of the disclosures made by over 1,500 firms listed in their *S&P Global indices,* by assessing more than 98 items in the annual reports of the firms, resulting in an *S&P* annual *'Transparency and Disclosure (T&D) Ranking'*. A study by Patell and Dallas (2002) purports to find that firms with higher *S&P* T&D rankings have higher price-to-book ratios, lower market risk and a higher market valuation and, based on these findings, this study concludes that by providing higher quality disclosure firms can reduce their cost of equity capital and reduce their risk profiles.

Another recent commercial study (Blue Rubicon/MORI, 2004) draws from 95 interviews with UK institutional investors and fund managers and with 101 senior executives from FTSE 100 and FTSE 250 firms. A main finding of this study is that 64% of the respondents stated that they consider 'good communication skills' to be the most important characteristic of a CEO, even ranking this quality above the possession of 'good leadership and management skills'. It concludes that "*Firms seeking to distinguish themselves from their competitors, and to derive a valuation premium by doing so, need to learn to communicate in a different, more transparent, open and insightful way*" and that "*... there is a valuation premium for firms and Chief Executives that can harness the power of positive sentiment and create momentum behind their particular story*".

However, there is in fact limited empirical academic research evidence to confirm that these views are not just mere hyperbole. The limited relevant empirical research is described below.

There is however one paper that very graphically portrays the direct impact that an effective disclosure policy can have on share price (Healy and Palepu, 1995). This is a case study of a US firm whose management considered that the market under-valued its shares because their accounting methods did not adequately reflect the quality of their business model. The managers adopted less aggressive accounting methods and used surplus funds to reduce the debt-to-equity ratio, but found that even after these actions were disclosed there was no significant change in the share price. Only when this policy was later combined with presentations and meetings with their main investors and analysts, where management could personally explain the company 'story', did the share price rise. This case study concisely exemplifies how the *form* of communications can be as important as its *content,* in affecting how the market assigns value to a firm.

Further, Lang and Lundholm (2000) test the share price reaction of firms choosing to release a high number of trading statements just prior to a new share issue (or, as they state, test *"whether management had hyped the stock"),* compared to that of firms that maintain a constant level of disclosure. The study finds that firms maintaining a consistent level of disclosure appear to successfully prevent an increase in perceived risk surrounding the new issue because, despite some price volatility surrounding the issue date, there is no abnormal share price behaviour in the following 18-months. However, firms that increased their disclosure activity suffer a much larger fall in share price at the issue announcement date. The authors suggest that this fall in price may be due to the market 'penalising' firms for increasing their disclosure frequency with the subsequently revealed intent of issuing equity in the future, i.e. that they were artificially *"hyping"* the stock. Furthermore, over the following 18-months these firms' shares continue to suffer negative returns, perhaps indicating that their attempts to "hype" were successful in artificially lowering their cost of equity capital at the time of the offering, but did not lead to any longer term benefits to the firm. These findings support the views of the IR managers,

described in chapter 2, that an effective IR policy should be consistent and have a long-term focus instead of aiming at short-term goals.

Healy, Hutton and Palepu (1999) test the stock performance of the 97 US firms that received the highest percentage annual increase over three or more years in the overall ratings of by the US Association of Investment Management and Research (AIMR) survey of corporate disclosure between 1980 and 1990 (this survey is fully described in section 6.1). They find that the firms with these sustained improvements in AIMR ratings experience a cumulative average rise in their industry-adjusted stock returns by 5% over the period two years prior to the first rating increase and two years afterwards. These firms also have increased institutional share ownership, higher analyst following, and enhanced stock liquidity over the 10-year period. Healy, Hutton and Palepu suggest that, because the higher ratings are largely due to additional voluntary disclosures, they result from active management decisions. This proposition is partly confirmed by evidence that the 97 firms show a significant increase in number of new share issues over the 10-year period, indicating that the increased disclosure quality was a conscious management policy to maximise receipts from the future shares issues.

Lang and Lundholm (1993), on the other hand, analyse the three separate AIMR disclosure category ratings that comprise the overall rating (Required Published Information, Other Published Information and Investor Relations). For 751 firms that are each rated at least once in each of these categories from 1985 to 1989, they test the correlation between the firms' three individual ratings and firms' market value, historic standard deviation of market-adjusted annual returns and the earnings/returns correlation, market-adjusted annual returns, analyst' earnings forecast error and the number of new shares issues. Their results show that the 'Investor Relations' category ratings are the most highly and positively correlated to all these variables, but particularly to the short-term financial performance variables, such as the market value of equity, the variability of market-adjusted annual equity returns and the earnings/returns correlation. The other disclosure category ratings are, on the other hand, most sensitive to the longer-term, structural characteristics such as annual equity returns, analyst' earnings forecast errors and the number of

new shares issues. Lang and Lundholm suggest that effective IR is more closely associated with short-term financial performance because, compared to a formal reporting policy, the IR policy is subject to a higher degree of managerial discretion and short-term flexibility, whereas the annual report and other mandatory published information are more rigid communication media and this is why they are more closely associated with longer-term and structural variables.

Finally, in a recent working paper, Bushee and Miller (2005) test 184 small and mid-cap. companies that initiate IR programs between 1999 and 2004 by hiring professional IR agencies. They find that these companies significantly increase their level of disclosure and press coverage (sourced from *Factiva*), stock trading activity (measured by monthly share volume and by monthly percentage of days traded), institutional ownership (measured by the number of institutional owners and by percentage of institutional ownership), analyst following (measured by the number of analysts issuing earnings forecasts) and market valuations (measured by changes in book-to-market ratio) after hiring a new IR agency, both in absolute terms and relative to a control sample matched on exchange, industry, time listed and prior investor following. Overall, the authors suggest that IR activities play a significant role in helping small and mid-cap companies to overcome their low visibility because they do not generally trade on a major exchange, to attract a wider following by investors and information intermediaries and to improve their market valuation.

3.1.3 Section summary

In summary, these five empirical studies constitute the limited body of empirical evidence on the relationship between effective IR communications and equity returns. My thesis seeks to contribute to and develop on this body of literature.

3.2 IR and Analyst Coverage

This section reviews the existing literature on the relationship between effective IR and analyst coverage.

3.2.1 Introduction

In this section I explain the importance of analyst coverage, the information analysts produce and the literature on the relationship between IR and analyst coverage.

This section then describes some existing empirical studies that test for analyst bias, the value of analysts' reports for investors, and research showing that some factors appear to both/either determine or be affected by the level of analyst coverage.

3.2.2 Why IR managers are concerned about analyst coverage

Section 2.2 of this thesis summarises some the discussions I held with IR managers, who state that they monitor the number and identity of the analysts covering their firm as a means of measuring their own IR performance and that they use information obtained from meetings and discussions with analysts as an important source of market feedback to report to their senior managers. Therefore firms appear to be seeking to maximise their analyst coverage and the value of their communications with analysts. The following literature provides some empirical evidence for why firms probably do so.

Firstly, a study by Botosan (1997) finds a significant negative relationship between enhanced corporate disclosures in annual reports and the cost of equity capital, but *only for firms with low analyst following* (below the average across the firms tested. Botosan proposes that this is because firms with high analyst coverage can rely more on analysts as an effective method of maintaining good communications with the market, rather than by relying on information conveyed in formal annual reports. This finding is extremely relevant to this thesis because it provides empirical evidence of the importance of the level of analyst coverage in any relationship between effective corporate communications and the cost of capital.

Also, Huberman and Regev (2001) recount a case study of a headline report in the *New York Times* in 2000 that a pharmaceutical firm had found a cure for cancer. Although the newspaper later reports that the 'cure' was found to be ineffective, at the time the first article appeared it was met by an immediate and dramatic rise in the firm's stock price that spread to the entire industry index and that continued even beyond the second article that totally discounted the previous claim. However, the main point of the case study is that exactly the same story had appeared in the prior year in the journal *Nature*, a science journal with much lower readership than the *New York Times*, and was met by only a minimal stock price reaction for this one

firm. The issue is that, although the *New York Times* headline report was not 'new news', it was met by such a dramatic and 'contagious' price reaction purely due to its publication in a paper with much higher public readership and prominence, showing that the way a firm's 'story' is told can have a greater impact that can the actual story.

In the same manner, firms can use their communications with security analysts to reach a wider and more influential audience because analysts act as a channel for the dispersion of information to the market. Ellis (1985) provides a theory to explain why it may be optimal for IR managers to focus on building and maintaining these communication channels with analysts. This is because a firm can arrange one meeting with many sell-side and buy-side analysts, who can then widely disseminate their research to the market, thus removing the need for the firm to individually communicate to many external parties. Ellis proposes that therefore an IR programme aimed at increasing analyst coverage and in ensuring that analysts have accurate and up-to-date information can be the most cost-benefit efficient and effective IR strategy.

Other research shows that analysts also consider their meetings with firms to be important. For example, Holland (1998a) interviewed a large sample of UK executives and their largest shareholders and analysts and found that all parties equally considered their meetings to be one of their most important sources of information. Similarly, the *Institute of Chartered Accountants of Scotland (ICAS)* commissioned a report (Marston, 1999) to obtain the views of the sell-side analysts of 10 FTSE100 UK firms on the company meetings to which they were invited to attend. The analysts' views, which are summarised below, show how both they and a firm can benefit from these meetings:

The benefits for analysts:

- Analysts find that these meetings provide important input for differentiating their research reports, and that their research notes are sometimes based on information obtained in only one company presentation.
- The meetings are an important chance to meet personally with the senior managers and to assess their personal qualities.

- The meetings act as a discussion forum and allow the analysts to learn from questions asked by other analysts and fund managers in attendance.
- The meetings are a means for testing the 'mood' and the attitudes of the management towards their business.

Analysts' views on the benefits to the firms:

- Managers use the meetings to maintain contact with the market, obtain feedback and gauge the market 'mood'.
- General industry and regulatory issues are sometimes discussed during meetings and this can be a very useful knowledge forum for all parties.
- The meetings are important for management to align the earnings expectations of the market with their own performance forecasts.

A follow-up study by Marston (Marston, 2004) extends her previous study by exploring the IR practices of 90 quoted firms throughout 18 different European countries. Marston finds that similar responses in these interviews, held in 2002, confirming her earlier results. The executives still consider that one-to-one meetings with buy and sell-side analysts to be their most important method of delivering the IR message, with telephone calls to analysts coming a close second. In fact, on average, respondents had held 112 one-to-one meetings each and they had personally met with representatives from 36 stock-broking firms and 110 investing institutions in the previous 12 months. This indicates the continued high value attributed by firms in communicating in a personal setting to potential investors and analysts.

3.2.3 The value of security analysts' research

Particularly over the past two decades there has been much research on the value of and stock market reactions to security analysts' reports. Early empirical research focused mainly on the market's reaction to revisions in analysts' earnings forecasts and stock recommendations. Most of this research shows positive (negative) abnormal returns for upward (downward) analyst earnings forecast revisions or new buy (sell) recommendations. For example Abdel-khalik and Ajinka (1982) find significant abnormal returns during the publication week of forecast revisions by

Merrill Lynch analysts and Lys and Sohn (1990) present evidence consistent with forecast revisions having information content that is reflected in stock prices.

Overall, the research on analyst recommendations has generally found a positive association between abnormal returns and the direction of the recommendation change. For example, Womack (1996) uses *First Call* data to test price reactions to stock recommendation changes to (from) the most extreme buy (sell) categories. He finds that stocks added to 'strong buy' lists earned size-adjusted returns of 3% while stocks added to 'strong sell' lists earned size-adjusted returns of -4.7% in the 3-day event period surrounding their release.

More recently Asquith, Mikhail and Au (2004) test the association between equity returns and changes in the many different elements of information contained in the analyst's reports issued by the *Institutional Investor* All-American analyst team members during 1997 to 1999. The information items they test include the earnings forecasts, stock recommendations and price targets but also the tone and strength of argument in the report narrative. Most of their findings are consistent with those in prior research. For example, they find that increases (decreases) in earnings forecasts are associated with positive (negative) abnormal returns over the 60-days post-release window and that recommendation reiterations, upgrades and downgrades are associated with insignificant, positive and negative abnormal returns respectively. They also find a significant association between increasing (decreasing) price targets and positive (negative) abnormal returns and, showing that price target revisions contain new information that is quickly impounded in market valuations.

However, they also show that these findings are not affected by the contemporaneous release of firm information from other sources (earnings announcements from *Zacks*, dividend changes and stock splits from *CRSP* and other changes relating to the business taken from *Dow Jones Newswire*), showing that analysts' reports provide new information. Further, Asquith, Mikhail and Au (2004) find that slightly above 50% of price targets in analyst' reports are achieved by the firms and when they are missed this is not by more than 16% above or below

and, finally, that the market reactions to analysts reports do not depend on the valuation methodology used by the analysts even though their methodologies are disclosed openly in their reports. The main contribution of this research is in showing how the strength of the analyst's argument in his/her report narrative can affect market' reaction to good and bad news portrayed in the numerical data in the same report. Investors appear to rely less on positive earnings forecast revisions and recommendation upgrades when the analyst's supporting argument in the text of the report contain mostly negative comments, showing that investors appear to pay close attention to the *total content* of analyst reports and especially in supporting information that carries 'bad' news.

Overall, the literature described above shows that all of the information in analysts' reports is valued in the capital markets and that it can have a significant impact on stock prices. It therefore supports any concerns of the IR manager of a firm may have over maintaining close communications with analysts and in ensuring that the information analysts use to write their reports fairly represents their own.

3.2.4 Analyst bias

I now review the literature on analyst' bias to address potential concerns that any such bias by the analyst respondents to the *IR Magazine* IR award survey may weaken it as a measure of IR performance for my research. Firstly, because a sell-side analyst may follow a firm that is also a corporate finance client of the same investment bank that uses his research, there have been concerns of a heightened risk of conflicting interests. This is because the analyst may be biased in producing favourable forecasts and recommendations for the client-firm to maximise the proceeds from a transaction for which the bank is acting as advisor and earning transaction percentage fees.

There has been a great deal of 'bad press' about the value and propriety of analyst reports and recommendations made recently and most notably during the 1990s dot.com technology stock price 'bubble' period. Research shows that during this period most analysts' recommendations in the US tended to be for well-followed, high growth shares and the ratio of buy to sell recommendations was

disproportionately high (Womack, 1996), suggesting that analysts may have been somehow 'pandering' to more liquid and profitable firms. Womack also found that analyst consensus share price forecasts were highly correlated with actual share prices and suggests that this may indicate that any biases incorporated in the information produced by analysts may have been absorbed by investors and have affected their decisions. However, since this research was conducted a range of new legislation in the US and the UK has been introduced aimed at eliminating the risk of this conflict of interest. The background and extent of the changes that have the most impact on IR are described in section 2.2. However, one of the impacts of these new regulations may be to see a rise in the number of 'independent' research analysts, although it is probably still too early to assess whether 'more research' equates to ' better research'.

3.2.5 The determinants of high analyst coverage

Another body of research is concerned with the variables that appear to influence analysts to cover a firm. Overall, this research, which I review below, shows that larger and less risky firms may find it 'easier' to attract analyst coverage than others, but that high quality corporate communications is also a significant factor that can determine a firm's level of analyst coverage. Firstly, a study by Bhushan (1989b) marked a significant advance in the understanding of factors that influence analyst following. Bhushan tests an econometric model in which the number of analysts following a firm is determined at the equilibrium of aggregate demand for, and supply of, analyst services, which in turn depends upon overall expenditure on analyst services. Empirical tests are performed to see how the following five factors influence the expenditure on analyst services:

i. Ownership structure; because increased institutional holding and a higher percentage of shares held by institutions should increase demand for analysts' services, whereas increased inside share ownership should reduce demand for analyst services.
ii. Firm size; because the benefits to the analyst from information-search should be an increasing function of firm size, larger firms should have higher coverage.
iii. Stock return volatility; because higher price volatility means a higher probability of a deviation between the expected returns based on public information alone and

the expected returns based on both public and private information, higher volatility should increase the demand and supply of analyst services.

iv. Task complexity; because a firm with more lines of business will require more effort and cost for the analyst to analyse and so reduce the demand for analyst coverage from their employers, who may otherwise need to pay the analyst more.

v. The correlation between firm and market return; because a higher correlation will reduce the marginal cost of information acquisition and so increase the demand for analyst services.

Bhushan's empirical tests confirm that the various factors operate in the directions he hypothesises as described above, showing that larger and less risky firms may find it 'easier' to attract analyst coverage than others. This conversely implies the IR managers of smaller, recently listed and higher risk firms may face particular problems in attracting analyst' attention.

The following literature also shows that analysts may be systematically positively biased towards larger sized firms, referring to firms that fail to attract analyst coverage as 'neglected firms'. This is distinguished from other research that claims to identify an anomalous stock price premium on small firms stocks, known as the 'small firm effect', whereby some firms with smaller market valuations systematically earn abnormal excess realised returns. For example, Banz (1981) found that portfolios comprising small firm stocks out-performed those of large firms and attributes this 'small firm effect' to capital market inefficiencies that result in lower stock liquidity for smaller firms, which systematically increase equity returns required by investors in compensation for holding illiquid stocks. However, more recent research suggests that any trading strategy that targets small firms may no longer be feasible because any small firm effect has been eliminated due to trading arbitrage.

Meanwhile, some other more recent research now suggests that any historic small firm stock price premium could instead be largely caused by differences in the information disclosure policies of smaller firms and because smaller firms are 'neglected' by analysts. For example, Brown and Kim (1993) interviewed a large sample of security analysts on their attitude towards the communication policies of small firms. These analysts said that they do not expect to receive as much voluntary and discretionary information from the management of small firms

compared to the level they expect from larger firms and that any supplementary information from small firms is normally only concerning 'good news'. This shows that analysts may simply have lower information-expectations for smaller sized firms, but also suggests that analysts may interpret information from smaller firms differently from that they receive from larger firms.

Further, Arbel and Strebel (1983) compare the equity returns of firms that are 'neglected' because of low levels of security analyst coverage compared to a control sample of intensively researched firms over the period 1972-1979. They find that the neglected firms' shares outperformed the control sample shares throughout this period and because their methodology controls for firm size, they attribute this to a persistent 'neglected firm effect', whereby stock returns are positively and significantly related to analyst coverage over and above any 'size effect'. Arbel and Strebel suggest that the underlying factor associated with better share performance may be *"information-availability"*, rather than size and that investors demand a premium for uncertainty caused by lack of information, requiring a higher return on stocks with less analyst research to compensate for a need to do their own fundamental analysis.

In addition, there is some industry research concerning the relationship between firm size and analyst coverage. For example, each year *Robson Rhodes (RSM) LLP* produces an "*Unloved UK Firms Index"*, which defines firms as 'unloved' when their 3-year cash flow growth is greater than market average, but their share price to cash per share ratio is below market average. The key finding from the 2004 index, comprising 234 firms from the FTSE All Share Index, is that the 60 firms at the top of the unloved index (highest cash flow/lowest valuation) are also the firms in the bottom quartile when ranked on market value. The RSM 2004 report uses this finding to illustrate the "*Challenges that smaller firms face, due to the ever-increasing size of the world's largest fund managers, and their investing focus. As of 13 February 2004, there was an average of 17 sell-side analysts covering each FTSE 100 firm, compared to only 7 for each FTSE 250 firm. This fight for attention in the increasingly competitive capital markets makes it imperative that these firms distinguish themselves from their peers on a number of bases."*

Secondly, a publication by Golding (2003), who managed asset management research at *Flemings* investment bank in London from 1978 to 1989, draws on his industry experience to provide some reasons to explain why analysts and also financial institutions and retail investors may prefer covering, and investing in, larger and better-known firms. Golding proposes two main causes of any such biases towards larger firms; financial reasons and embedded investment preferences of financial institutions.

Financial reasons for analysts and investors

Firstly, larger firms tend to have a higher number of shares in issue that are traded more actively. More frequently traded shares also have a lower bid-ask spread, because competition 'squeezes' the trading margin. A lower spread implies a lower potential gain or loss on buying and selling and so investors attach a lower level of risk to these shares. These factors mean that higher liquidity in turn can help to maintain or increase liquidity and that low stock liquidity can represent a 'vicious trap' for smaller firms. Also, because larger firm shares tend to be traded in larger transaction sizes and because trading costs are fixed and so are a smaller percentage of the total value of a larger trade size, net returns are higher on larger transactions and this may also create a 'vicious circle' of preference towards larger firms. Finally, Golding suggests that analysts also have financial reasons for preferring to cover large firms, because there are lower economies of scale in researching smaller firms with a smaller market wiling to pay for the costs of research of these smaller firms.

Financial institutions' investment preferences

The presence of any institutional barriers for firms to access the capital markets was formally recognised in the UK by the *Myners Report*, March 2001, commissioned by the UK Government to investigate the practices of UK financial institutions and which refers to *"factors encouraging institutional investors to follow industry-standard investment patterns, which focus overwhelmingly on quoted equities and gilts and avoid investing in small and medium-sized enterprises and other small firms".*

Golding (2003) explains that investing institutions may firstly favour larger firms because smaller firms account for a small percentage of the market index value, so a fund that benchmarks an index automatically allocates a smaller percentage of its

portfolio to a small-cap fund or single small firm investment. This means that passive index fund managers may move out of some stocks regardless of price as their mandate automatically excludes firms below the level of the index they track. Also, because a fund manager makes investment decisions in terms of the minimum percentage of the fund he is prepared to put into a single investment, an investment in a larger sized firm absorbs more 'fund units' and tends to squeeze-out investment in smaller firms by fund managers. Also, if a fund manager fills large fund units with investments in a single small firm, he may own a significant percentage of its total equity, which brings the burden of additional accounting and disclosures and any share transactions are then more likely to affect market price, meaning that the fund may only be able to sell large amounts of shares at a substantial discount. Finally, Golding highlights the more fundamental issue of the additional time that may be involved in evaluating and monitoring small firm investments by fund managers and their brokers, which may require additional labour-intensive and costly monitoring, Golding (2003).

Issues over low analyst coverage of small firms also receive a deal of comment in the financial media, an example of which is as follows: "*Since 1999 the proportion of stocks not covered by analysts has risen from 25% to 30% and for the first time fewer than half the total have any independent organisation providing forecasts. The bigger the firm, the more likely it is to attract interest, so the top dozen UK stocks are all covered by 30 or more analysts while the 400 smallest, including those on AIM, have no coverage at all. This has been called the 'discount for neglect' and has been estimated to cut some £8 billion from their (smaller firms') total stock market value. Yet these are shares that, despite all the hazards, have outperformed large-cap stocks in the past few years. Just think what they might have done if they received a proper slice of analysts' attention.*" (The Evening Standard, "Unfair Shares", A Hilton, 22 June 2004).

A separate factor that may determine the level of analyst coverage is how well a firm already provides the market with information. This is because analyst research can be viewed as partially substituting for any information gaps between management and the market that management's communication policy fails to fill. For example

Bhushan (1989a) finds that firms that release a higher number of accurate earnings forecasts have lower levels of analyst following. This finding implies that analyst information is a substitute for when firms issue less reliable information and that analyst coverage may therefore be higher when firms fail to issue earnings warnings or have a poor reputation for forecasting their performance, for example. Nevertheless, the apparent continued presence of a ready market for analyst research suggests that they still provide additional information and analyses that act as value-adding complements to firms' own information releases.

Finally, Lang and Lundholm (1996) also conducted some seminal research on the factors determining analyst behaviours. They test the relationship between the AIMR disclosure ratings between 1985 and 1989 and the accuracy, dispersion and volatility of analyst' earnings forecasts. Their methodology controls for five variables that prior research suggests may affect analyst following and their earnings forecasts; these are firm size, the standard deviation of equity returns, the historical returns-earnings correlation, earnings surprise (difference between current EPS and prior year EPS divided by prior share price) and the number of analyst' forecast revisions each year. Lang and Lundholm find that the level of analyst following is significantly higher for firms with a higher 'Overall Rating' and with a higher rating for the 'Investor Relations' and 'Other Published Information' AIMR categories, but is not higher for firms with a high rating for 'Annual Report'. On this basis, analyst-following appears to be higher when a firm provides high quality, frequent and more informal communications, but that the annual report as a form of communication does not contribute significantly to the effectiveness of an overall disclosure strategy. They further find that the dispersion of analyst' earnings forecasts is lower for larger sized firms and for firms given a higher 'Overall Rating', a higher rating for the 'Investor Relations' and 'Annual Report', but not for their rating for 'Other Published Information'. On the other hand, forecast dispersion is higher when past earnings variability and 'earnings surprise' variables are higher. Lastly, they find that earnings forecasts are more accurate for large firms and for firms given a high overall rating and higher 'Investor Relations' and 'Other Published Information' ratings.

Overall, this research shows that analysts find it harder to forecast earnings for more risky and smaller-sized firms and it provides strong evidence to suggest that high quality IR may be effective in increasing the convergence of opinion in the analyst community and, thereby, that effective IR may result in the market receiving a more accurate consensus opinion on a firm's future financial performance.

3.2.6 Effects of high analyst coverage

Research that I review in this section suggests that analyst coverage can benefit a firm, in terms of affecting its share price, raising the quantity of information about a firm in the market and by increasing a firm's share ownership. Firstly, and consistent with the findings in the other research described above, Chung and Ho (1996) find that analyst-following is significantly higher for larger sized firms, but suggest that this is primarily an *effect* of increased pressures on managers to improve the financial performance of their businesses from the external scrutiny of analysts and that investors may benefit from the way this motivates managers to act in their interests.

Walmsley, Yadav and Rees (1992) find a significant impact on the stock prices of firms shortly after analyst-firm meetings, suggesting that the research reports produced by analysts following these meetings are an important source of new information for investors and upon which they act. Similarly, Francis, Hanna and Philbrick (1997) compare the equity returns of a sample of firms immediately after meeting with analysts and brokers where they present their financial results with the returns of a matched control sample of firms. They find that the shares of the 'presenting' firms earned significantly higher returns immediately afterwards and that the number of earnings forecasts produced by analysts for these firms also increased. And finally, Hussain (2000) find a significant association between the level of analyst following and institutional ownership of a firm, implying that firms with a higher analyst following may benefit from increased sources of equity finance and a more liquid share market.

3.2.7 Interaction between the determinants and effects of analyst coverage

Therefore, the literature both shows that factors such as firm size, firm risk and a firm's communication policy can *determine* the level of analyst coverage, but also that these factors can in turn be *determined by* the level of analyst coverage. This suggests that all of these factors influence each other simultaneously and are jointly determined, in an endogenous circular relationship. This proposition is also supported by some views reported in the financial press, an example of which is shown as follows: *"The relationship between research, valuation and liquidity operates directly and indirectly. A lack of research leads to lower valuations and reduced liquidity. At the same time, less research is called for if a stock falls in market capitalisation or volume of shares traded." (Financial Times, 'Filling the Gap', D Blackwell, 26th April 2004).*

Based on this premise, O'Brien and Bhushan (1990) specifically test for a symbiotic relationship between the level of analyst following and levels of institutional ownership by performing tests that separately control for each factor, using a simultaneous equation econometric model. They find that there appears to be an endogenous jointly determined relationship, whereby high levels of analyst following both lead and lag high levels of ownership, and vice versa. This implies that analyst coverage may both encourage share ownership but may also be the analysts' motivation for following a firm. Meanwhile, Walker and Tsalta (2001) investigate the relationship between the quality of firm's financial disclosures and analyst following and the number of earnings forecasts for UK firms and, whilst finding strong evidence of a positive correlation between the quality of disclosure and the number of forecasts, their tests of the direction of any causal link show that high levels of analyst coverage only appear to *induce* firms to increase the information content of their annual reports.

3.2.8 Section summary

Therefore, whilst prior empirical research finds that there are factors that appear to determine, and factors that appear to be affected by, analyst coverage, it shows no consensus on the question of whether analyst coverage encourages, or is a result of, higher quality corporate communications. My thesis seeks to contribute to this

existing literature relating to this question by empirically testing the levels of analyst coverage of firms surrounding the period when they have significantly high quality IR and by cross-referencing any findings to the results of my tests of the prior and subsequent equity returns and stock liquidity of firms with effective IR. The results of my tests on analyst coverage are shown in section 7.2.

3.3 IR and Equity Trading Volumes/Liquidity

3.3.1 Introduction

This section describes some established methods for measuring liquidity, how firms monitor their equity trading levels to gauge the liquidity of their stock and keep aware of the identity of their shareholders, and also reviews the literature relating to any putative relationship between liquidity, equity returns and effective IR, which is a relationship that has been concisely proposed as follows, *"A corporation can affect liquidity – and consequently its cost of capital – by the amount and quality of the information it releases to investors"* (Amihud, 1989).

3.3.2 Monitoring liquidity and stock ownership

IR managers normally monitor their share-ownership profile and ownership turnover using a 'shareholder register' and, according to the Buchannan Communications/London Stock Exchange, '*Investor Relations; a practical guide* 2004, managing and targeting the shareholder register is one of the key roles of IR. Management of the shareholder register is an important part of IR because each type of shareholder has particular trading patterns and preference that can differently affect share liquidity and about which the IR manager should be aware, and also because each shareholder type will probably also request a different form and frequency of information from a firm.

For example, in some cases retail investors may be more 'loyal' to particular firms than institutional investors because they are more familiar with particular brand names for example, and therefore hold stock for longer periods, although it may take many individual private investors to match the buying power of an institution. Conversely, institutional shareholders can inject liquidity into the stock market because of the generally larger size of their transactions (Buchannan

Communications/London Stock Exchange, '*Investor Relations; a practical guide* 2004). Therefore, although firms have no direct control over who owns their shares, an IR programme that successfully targets a particular shareholder type could significantly affect both the overall size of the shareholder base, the mix of shareholder type and in turn affect its stock price and stock liquidity.

3.3.3 Measuring liquidity

A review of the literature shows that liquidity is an elusive concept and various measures of liquidity have been employed in the existing research. To demonstrate this, I review some of the most relevant research below, which explains the two main methods used in the existing literature for measuring liquidity and the reasons for the choice of the method I use in this thesis.

In my thesis I measure stock liquidity using equity trading volumes and test the relationship between a firm's IR rating and levels of, and changes in, its trading volume over time. However, because liquidity can also be defined as *"the ease with which the market can absorb volume buying or selling, without dramatic fluctuation in price"* (Amihud, Mendelson and Lauterbach, 1997), tests are also performed of how the firm's equity trading volumes change in relation to unit changes in share price in the periods surrounding their nominations in the IR awards. An alternative, and frequently employed, method to measure liquidity is by the size of the bid-ask spread. However, in addition to equity trading volumes being a natural and intuitive measure of stock liquidity, research provides both reasons and empirical evidence to support its use as a measure for liquidity.

For example, Amihud and Mendelson (1986) empirically test a theoretical model in which equity trading volumes are an increasing function of liquidity and a decreasing function of the stock's bid-ask spread, primarily due to "*increased trading friction and transaction outlays incurred for less liquid stocks*". From empirical tests of this model, they find that stocks that are listed on exchanges where it is more difficult to buy and sell, have higher transaction costs and a higher bid-ask spread, but also attract a higher percentage of long-term investors. Amihud and Mendelson explain that long-term investors both trade less frequently and in *smaller volumes*, because

they can amortize transaction costs over a longer holding period and so are more willing to hold these illiquid stocks, and that this explains why there is a direct negative relationship between a stock's bid-ask spread and trading volumes.

Atkins and Dyl (1997) further examine the average holding periods and bid-ask spreads for NASDAQ stocks from 1983 to 1991 and for NYSE stocks from 1975 to 1989 and find that length of holding period is strongly correlated with size of bid-ask spread. Based on this, Atkins and Dyl also conclude that using equity trading volumes to measure stock liquidity is akin to using the bid-ask spread and that it may in fact be a preferable method because it is likely to be a measure exhibiting greater cross-sectional variation.

3.3.4 Liquidity costs and stock returns

The reason that firms are concerned over low or reduced stock liquidity is the direct relationship between liquidity and share price. This is because investors require a higher return or 'liquidity premium' for holding less liquid stock, and this premium represents a higher unit cost of equity for the firm. This means that a firm with low liquidity stock must earn a higher return on its assets in order to increase shareholder value, compared to a similar firm with more liquid shares. The existing empirical literature shows that increased stock liquidity is a major determinant of the cost of equity capital and thus directly affects stock prices, with both Amihud and Mendelson (1986) and Brennan and Subrahmanyan (1996) finding return differences, *ceteris paribus*, of nearly 7% per annum between liquid and illiquid stocks.

Amihud, Mendelson and Lauterbach (1997) show how direct the relationship is between stock liquidity and share price by testing changes in the prices of the stocks listed on the Tel Aviv stock exchange both preceding and following a month in 1996, when the exchange was up-graded to continuous trading, increasing both the ease of trading and available trading hours. Because no quote information was available on the exchange, liquidity is measured using the volumes of equity traded rather than by the size of the bid-ask spread. Amihud et al. (1997) find that, over a 30-day period following this structural change, the liquidity of the shares transferred to the

new trading platform increased significantly and cumulative average market-adjusted returns rose by approximately 5.5% in this 30-days, due to the increase in liquidity. They attribute this direct relationship between increased liquidity and stock returns to the reduced transaction costs for trading on the new trading platform. I explain further the importance of transaction costs and how effective IR can impact these costs, and therefore can impact liquidity and stock returns, below.

Stock trading transaction costs come mainly in the form of charges made by market intermediaries, but also include any other direct costs incurred by investors when trading (financial advice from an independent broker or bank, for example). Market makers normally charge a fixed fee per trade, although they sometimes also levy a percentage based on trade value. Although trading costs usually represent a small percentage of the price of a security, because they are incurred each time a transaction is made, the cumulative cost of trading a certain volume of asset rises significantly if it is made in small sized 'bundles'. But most importantly, higher transaction costs are charged for less liquid shares.

Campbell and Kyle (1993) explain that this is because some trading business is generated from informed traders (acting on information that motivates them to trade) and some by liquidity/noise traders (who target stocks based purely on current liquidity levels in anticipation that the stock will be traded in higher volumes in the future and this will drive-up the price) and market makers cannot distinguish between orders that are generated by informed traders from that generated by liquidity traders. Therefore, they charge higher transaction fees for shares with lower traded volumes, because this business is more likely to driven by liquidity traders who the market maker suspects may have privileged information that the future liquidity of these stocks will rise. Business generated for more liquid shares is more likely to be generated by informed traders, acting on publicly available information, and so the market maker can charge lower fees for these more liquid shares to generate an equivalent fee income.

An alternative supply-side explanation is provided by Frankel, Kothari and Weber (2002), who propose that for a fixed total supply of shares a general increase in

liquidity will increase the volatility of share prices. Increased price volatility creates more profit opportunities for market makers, who are then more willing to charge lower transaction fees. Therefore, increased liquidity and lower transaction costs directly increase *net* stock returns and the price that investors are willing to pay because they price securities according to the return they expect to receive *net* of costs. Based on this, in the following section I explain how effective IR can affect the size of transaction costs charged by market makers, by both increasing liquidity directly and by reducing the level of perceived risks that investors associate with a firm's stock.

3.3.5 IR and liquidity

One method to manage the trading activity of a stock is by directly increasing or decreasing the number of shares in issue by a new share issue or share repurchase. However, interventions in the capital markets can be a very costly process and may also not actually impact on stock liquidity greatly if new shares are not taken-up or if the issue fails or simply dilutes share price, all of which could conversely lead to lower trading activity and reduced liquidity. Also, capital market transactions may have undesirable 'side-effects' in terms of a heightened risk associated with the business, or that the business has a shortage of cash or because the ownership of existing investors is diluted. However, a more indirect method of affecting liquidity is by improving the corporate communication policy to 'market' the shares in issue more effectively, to stimulate trade, akin to the marketing of the firm's products. This may involve both an IR strategy of enhancing the information released to the market and by targeting a particular type or nationality of investor. If this effectively reduces the level of risk that investors and market makers attach to the firm's stock, then this could both reduce investors' required returns and the size of transaction costs that market makers charge for dealing in the firm's shares. This is how effective IR can both directly and indirectly, via an impact on reduced trading costs, improve liquidity and stock returns.

3.3.6 Section summary

In summary, although the existing empirical literature shows the potential for a direct relationship between the level and quality of information about a stock and stock

liquidity, there is currently no literature that directly tests the relationship between enhanced IR and liquidity. It is this proposition that I test empirically in this thesis and the results of my tests are described in section 7.3.

3.4 IR the Cost of Equity Capital

3.4.1 Introduction

This section is organised as follows. Section 3.4.2 explains the meaning of the cost of equity capital and in section 3.4.3 I review literature showing that there are several possible methods that can be used to estimate the cost of capital. This review shows that the most appropriate method for estimating the cost of equity capital is still an issue of wide academic and practical debate and, in this vein, Kothari (2001) states " ... *attempts to estimate the market risk premium and the cost of equity address an important question*".

As explained in section 3.4.5 below, I use the *Finite Horizon Gordon Dividend Growth Model* to estimate the cost of equity capital and my methodology for doing so is described in section 6.5. However, because the choice of method to calculate the cost of capital is critical to this thesis, I use the literature review to explain the reasons for using this method based on the various models used, and recommended by, existing research that tests the relationship between effective IR or enhanced corporate communications generally defined and the cost of equity capital.

3.4.2 The cost of equity capital

The cost of capital for financing any investment, whether for an entire firm or for a single stock, is a function of the minimum required rate of return that the capital providers expect to receive had they invested their capital elsewhere. More formally, the lowest boundary of the cost of equity represents the minimum return 'hurdle rate' that a business must generate to meet the current investment expectations of equity shareholders or that will attract new investors.

Existing and potential investors will only hold a stock if it promises a high enough future return that accords with the level of risk they associate with receiving this return. The role of IR is to provide investors with information that may reduce their perceived risk level and, in this way, effective IR can reduce required returns and the

cost of equity. This is why it is important that firms with external equity financing understand, are able to monitor, and may attempt to influence the level of their cost of equity capital via an effective IR policy.

3.4.3 Valuation models to estimate the ex-post cost of capital

Traditional methods for estimating the cost of equity capital, or the equity risk premium, use mathematical models to extrapolate from past, or ex-post, associations between the return on a stock and return on the market index, adjusting for any firm-specific risk.

The most well-known of these models is the Capital Asset Pricing Model (CAPM), (Sharpe, 1964 and Lintner, 1965), which predicts that a stock's required return is a function of a risk-free rate plus an equity risk-premium that is a function of firm-specific risk, measured by equity beta (ß). The so-called empirical form of the CAPM specification is:

$$R_t - R_{ft} = \alpha + ß(R_{mt} - R_{ft}) + \varepsilon_t$$

where:

α = the intercept

R_t = the return on the stock at time t,

R_{mt} = the return on the relevant stock market portfolio at time t,

R_{ft} = the risk free rate of interest at time t.

ß = equity beta factor (If ß is 1, stock returns are expected to move exactly in line with movements in the market portfolio of assets)

ε_t = the error term.

There are other ex-post cost of equity valuation models that build on the principles of the CAPM, but that introduce other risk factors to attempt to reflect factors that explain the variation in observed equity returns. For example, Fama and French (1992, 1993) developed a three-factor model that specifies three key risk factors that influence required security returns, equity beta, market value and the book-to-market ratio. Subsequently, Carhart developed a four-factor model by adding a 'momentum' risk factor (Carhart, 1997).

The main differences between these various models are only over which factors they use to reflect firm-specific risk, but there has been wide academic dispute over the 'correct' weighting of these factors, what the 'correct' market risk premium is, and also over the optimal period to sample past returns. And although these models are still currently widely in use, they have been extensively tested and are now considered "*unavoidably imprecise*" (Fama and French, 1997).

Perhaps the main weaknesses of these ex-post asset-pricing models are in the underlying set of assumptions about the capital markets upon which they rely, which are essentially the same assumptions that underlie the Efficient Markets Hypothesis (EMH) (Fama and MacBeth, 1973). Therefore, any test of the accuracy of an ex-post model in explaining equity pricing involves a joint-test of the model used and of the degree to which the capital markets act according to EMH assumptions. Indeed, Roll (1977) criticises the CAPM on the basis that it is not a testable model, as any test of it is a joint-test of the model and the assumptions of market efficiency that underlie it.

Perhaps most importantly though, all ex-post methods are built upon the premise that it is possible to estimate future discount rates and future required equity returns by inference from *past performance*. However, this approach fundamentally fails to appreciate that, in fully efficient capital markets, future stock returns should not be systematically related to historical returns, and so the derivation of estimates of the *ex-ante* cost of equity capital for discounting future cash flows which are based on past returns could be seen as intuitively 'incorrect'.

3.4.4 Valuation models to estimate the expected (ex-ante) cost of capital

The 'ex-ante' or 'expected' cost of capital is a current estimate of the stock return that investors require in the light of all past and present information that they deem relevant in affecting its size. So, by increasing the quality and quantity of information for investors, effective IR should be able to have a major impact on the ex-ante cost of equity capital, whereas IR should have no impact on the cost of equity calculated using an ex-post model.

However, investors' 'expectations' are, by definition, not observable or directly measurable and can only be estimated from currently observed stock prices set in the market by the impact that investors' trading has on market prices and from approximations about future valuations.

There are also several future-oriented valuation models for estimating the 'ex-ante' or expected cost of capital that my thesis might have employed. Underlying all of these valuation methods is a dividend-discounting model, whereby current share price is equated to the present value of future dividends and future cash share re-sale value all discounted at the risk-adjusted expected rate of return (Williams, 1938). When the only known variable is the current price and future dividends and prices can only be estimated, this formula becomes a discounted cash-flow calculation with the implicit discount rate being the implied cost of equity estimate.

All ex-ante models can therefore only estimate a cost of equity capital, which is implied or is implicit from discounting a stream of future expected or forecasted values over a future period of time and by equating this to the current share price. The only differences between these ex-ante models lie in the type of future variable discounted, the assumptions made about future growth rates of these variables, how these growth rates vary over time and in the period over which the discount is performed. For clarity, I have divided the models used in the existing relevant literature into three general types:

i. Future dividend and stock price models

These models are all variants of the classical Gordon Growth Model (Gordon, 1962), which equates the current stock price to future discounted dividends and assumes a constant discount rate and constant growth of dividends into perpetuity. The Finite Horizon Gordon Growth Model makes the same assumptions, but instead discounts future dividends over a shorter and finite future horizon and replaces the value of all future dividends at a finite future date with a terminal value.

ii. Earnings capitalisation models

These models are identical to the first type but replace dividends and stock prices with earnings per share (EPS). This is possible because under certain conditions

and by making various assumptions it can be shown that discounted future dividends and share prices can be substituted with forecasts of future EPS or with return on equity (Fama and Miller, 1972). This concept is compelling because it accords with the spirit of Miller and Modigliani's Dividend Irrelevancy Theory (Miller and Modigliani, 1961) which proposes that, under certain conditions, the market value of a firm is a function only of a firm's investment policy and the returns from these investments and that interim dividends are irrelevant.

iii. Residual income models

The first residual income model that became widely used in the literature follows the research by Edwards and Bell (1961) which was later developed by Ohlson (1995) and Feltham and Ohlson (1995). The model replaces dividends and share prices in the dividend discount model with only currently known accounting data. In simple terms this is because, under the assumption of 'clean surplus accounting', the cash flows of a stock in the form of dividends and future share price can be shown to be theoretically identical to book value profits and assets values. I do not fully describe this proof here, because it is beyond the scope of my thesis and my methodology does not use this type of valuation model. However, for completeness, this form of the model equates current book value to the summation of the discounted present value of expected abnormal earnings (where abnormal earnings are defined as forecasted earnings minus a capital charge equal to the forecasted book value times the discount rate). Solving this formula using mathematical iterations results in a 'best fit' discount rate that is the estimated cost of equity capital.

Although residual income models appear to be more sophisticated compared to the more simple discounting models, they rely on several simplifying assumptions, the main one that there is clean-surplus accounting. Also, these models are also only essentially replacing dividends and prices in the Finite Gordon Growth Model with accounting book values, meaning that they have the advantage of ease-of-access to the data required. These models have become popular in the literature that relies on an estimate of the cost of capital and the model is also used by Botosan in her seminal paper (Botosan, 1997) that I previously describe in section 1.1 and that I review again in brief in section 3.4.5, below.

3.4.5 Literature relating to the cost of equity capital

The following literature provides the basis for my choice of method for calculating the ex-ante cost of equity for the firms with effective IR that I test in my thesis. I have divided this literature into the following two areas.

i. Literature that compares cost of capital models

Firstly, because there is no consensus authority on, or agreed opinion on, any one 'best' method for calculating the cost of equity capital, I review the key literature that tests different models to conclude which model is 'best' for my purposes. This is done in these papers by comparing how well each model explains the observed distribution of past equity returns or risk factors that are associated with equity returns.

ii. Literature using specific cost of equity models

Secondly, I review the literature that uses specific valuation models to derive cost of capital estimates for a sample of firms, and then tests for any relationships between the resulting cost of equity estimates and other characteristics of firms, such as the quality of their corporate communications and levels of analyst following.

i. Literature that compares cost of capital models

Here I review the three most relevant and recent studies that address the issue of which is the 'superior' model to use for estimating the expected cost of equity capital.

The first study, by Dechow, Hutton and Sloan (1999), provides an empirical assessment of the residual income valuation model proposed in Ohlson (1995). The empirical results of this study generally support Ohlson's model, but show that it provides only minor improvements over implementations of the dividend-discounting model, which capitalise short-term earnings' or share price and dividend forecasts. Meanwhile, a recent discussion paper Kothari (2001) reviews the literature on the cost of equity capital and concludes that this existing research generally provides evident to suggest that dividend discounting models do a much "*poorer job of explaining cross-sectional variation in market values*" than the simple earnings capitalisation models and the more "*rigorous*" residual income valuation models.

However, the most recent research by Botosan and Plumlee (2005), which is purely aimed at comparing alternative proxies for the expected equity risk premium,

concludes that "***We find that the rDIVPREM estimate (The Finite Horizon Gordon Growth Model, referred to as the Target Pricing Method in this paper) and the rPEGPREM estimates are consistently and predictably related to market risk, leverage risk, information risk, residual risk and growth. Based on these results, we conclude that rDIVPREM and rPEGPREM dominate the alternatives, and recommend that individuals requiring firm-specific estimates of expected cost of equity capital rely on either of these two methods as opposed to the alternatives we examine***".

It is on these grounds that the "rDIVPREM " model is used in this thesis.

The five models tested are:

- *rPEGPREM* - discounted forecasted EPS based on forecasted industry average return on equity (ROE)
- *rDIVPREM* - the finite horizon dividend growth model based on discounted forecasted dividends, share prices and growth rates;
- A model that discounts forecasted EPS and growth rates;
- A model that discounts equity returns based on economy wide averages over the future 12-months;
- Simple equity buy-and-hold returns over the future 12-months.

These models are compared by testing how well the distribution of the estimates produced is related to the distribution of factors reflecting firm risk and therefore are systematically associated with security prices and the cost of equity capital. These risk factors are: un-geared equity beta, leverage/gearing ratio, earnings growth, momentum, book-to-market ratio, and market value of equity capital. Because Botosan and Plumlee also recommend the rPEGPREM model I describe the model below. This model was also considered for this thesis, but because the data for calculating the rDIVPREM model was already available for the full sample of firms being tested, only the rDIVPREM model was used.

rPEGPREM Method

This model is also derived from the dividend discount formula but replaces expected future dividends with future earnings per share (EPS) by imposing a series of assumptions related to near term earnings and 'abnormal' earnings and the rate of growth of short-term abnormal earnings and a finite forecast horizon. This model is based on the Ohlson and Juettner-Nauroth (2003) model that is calculated using only forecasts of EPS with a five-year horizon. Then, following Gode and Mohanram (GM) (2003), Botosan and Plumlee (2005) replace the five-year EPS growth for short-term (2 year) analyst' EPS forecasts and assume that EPS in future grows in line with economy-wide growth (based on the current risk-free interest rate). Finally, the *rPEGPREM* model of Botosan and Plumlee (2005) is based on the GM (2003) model but imposes two further assumptions; future dividends are zero and there is no growth in abnormal earnings beyond the forecast horizon, resulting in the following model:

$$rPEGPREM = \frac{\sqrt{eps_2 - eps_1}}{P_0}$$

where:
P_0 = current share price, eps_1 = forecast EPS 1 year ahead and eps_2 = forecast EPS 2 years ahead.

This mirrors the 'PEG ratio' model of Easton (2004) but uses short-term forecasted EPS and assumes zero growth beyond the forecasts horizon and therefore will be very sensitive to actual growth rates and will mainly differ from other estimation models depending on the growth rate assumed.

In the following section I review the literature that chooses one of these ex-ante valuation models and tests how this is related to disclosure quality.

ii. Literature using specific cost of equity models

The exact mechanism behind a potential relationship between information disclosure and the cost of capital is unclear. Diamond and Verrecchia (1991) argue that, theoretically, enhanced corporate information disclosure will reduce the cost of

capital by its effect on reducing information asymmetries between firms and external investors, resulting in reduced transaction costs and higher stock liquidity. However, Easley and O'Hara (2001) propose that enhanced information reduces the equity risk premium primarily by reducing the premium that investors require to compensate for risk they associate with being uninformed.

Overall in the literature, although *the direction of the relationship between disclosure and cost of capital is normally predicted to be negative,* the empirical research that tests this theoretical relationship does not always bear this out, as I describe below.

Firstly, in her seminal study, referred to above, in which Botosan (1997) finds weak evidence of a direct negative relationship between enhanced corporate disclosure quality and the cost of capital, the ex-ante cost of capital is estimated by employing a model based on the Edwards and Bell (1961) and Ohlson (1995) residual income valuation models, described above. Her regression equations control for firm market value and market beta, because "*prior research documents a significant association between market value and both the expected cost of equity capital and disclosure level"* and market beta is included to control for systematic risk.

Secondly, Hail (2002) explores the relationship between disclosure quality, measured by a disclosure index issued by the Swiss Banking Institute (SBI), and cost of equity capital of 73 Swiss firms in one year (2000) and finds a significant negative relationship between the score in this index and the cost of equity capital. Hail estimates the cost of capital employing an 'earnings capitalisation model', discussed above, using forecasted earnings per share (EPS) over a 12-year forward horizon and derives the rate implicit in discounting these forecasts to current share price.

The findings of these two papers are in line with the direction of the relationship between enhanced disclosure and the cost of equity predicted by theory. I have previously critiqued Botosan's 1997 paper in section 1.1 and so do not further review it in this section, however Hail's study is also based on a small, and therefore perhaps unrepresentative, sample that limits the generalisability of his findings and

there may also be weaknesses in the methodology employed by the SBI when constructing their disclosure index that Hail uses to measure disclosure quality.

Other recent empirical research tests the relationship between the cost of capital and the ratings in the AIMR corporate disclosure survey, which I describe further in section 6.1 when I discuss in more detail my use of the *IR Magazine* IR awards as a proxy measure of effective IR. The main relevant study using this methodology is Botosan and Plumlee (2002), referred to previously, who seek to test the association between the ratings from the AIMR corporate disclosure surveys 1986-1996 and firms' cost of equity capital during the periods over which they are rated, where Botosan and Plumlee estimate the cost of capital employing only the Finite Horizon Gordon Dividend Growth model [2].

In their model they use the consensus of analysts' forecasted dividends, share prices and growth rates published in *Value Line* over a four/five year future time period (the maximum time horizon over which the forecasts are published in *Value Line*) and stock prices from *CRSP*. The research hypotheses are tested using Fama and Macbeth (1973) cross-sectional regression methodology over the 10-year period to test the relationship between the estimated cost of equity and each of the individual AIMR disclosure category ratings: 'Overall Rating', 'Required Published Information', 'Other Published Information' and 'Investor Relations', and controlling for firm market value and market beta following Botosan (1997).

Botosan and Plumlee find that the relationship between cost of equity capital and 'Overall Rating' is insignificant, stating that, "... *this is at odds with our expectations and theory, which suggests that greater disclosure is associated with a lower cost of capital*". Also, and most critically, contrary to both the hypothesised results and to theory, the relationship between the 'Investor Relations' rating and the cost of capital is found to be insignificant. This implies that *the quality of investor relations* (at least

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[2] The paper notes that Botosan (1997) derives the cost of equity capital estimates from the Edwards-Bell-Ohlson (1995) model, but states that estimates produced using these two approaches should be identical barring any violations of the clean-surplus accounting relation. Although the results are not presented by Botosan and Plumlee (2002), the findings on the relationship with the quality of disclosure are not altered if the cost of equity capital estimates are derived using the Edwards-Bell-Ohlson model instead.

as measured in this study) *makes no difference to the size of the cost of equity capital.* Botosan and Plumlee do not provide any possible explanations or reasons for this result, except to state that it shows how it is important to distinguish between specific forms of communication when testing the association between disclosure level and the cost of equity.

Further, the relationship between the rating for 'Other Published Information' (essentially comprising non-mandatory firm information disclosed in between annual, interim and quarterly reporting dates) is found to be *significantly positive*. These findings are also unexpected and contrary to the results predicted by theory. This result implies that higher quality information in this form is associated with a *higher*, not a lower, cost of equity capital. Botosan and Plumlee propose that this is because frequent and ad-hoc provision of firm information throughout the year may actually cause increased uncertainty for investors and result in higher price volatility, which would lead to higher estimates produced for the cost of equity capital that are calculated using future share price forecasts.

They do however find a significant and negative relationship between the rating for 'Required Published Information' (essentially annual report and associated annual mandatory filings) and the cost of equity capital, a result that is in accordance with those predicted by theory and consistent with the findings of Botosan (1997) for firms with low analyst following.

Therefore, although Botosan and Plumlee (2002) mark a significant milestone in the literature on the relationship between effective IR and the cost of equity, their study finds no significant relationship. However, Botosan and Plumlee only report the overall regression coefficients for the full, pooled samples of firms across the 10-year period and do not present the coefficients from testing the relationship over any discrete year within this 10-year period. This raises the possibility that their findings may have been different, or may have varied between years, had such tests been performed and presented.

Another potential problem is the 'omitted variable' problem i.e. that there are correlated omitted variables that are contaminating the research results. For example, Gietzmann and Trombetta (2003) argue that there are other potential *"messages upon which investors may also rationally condition their investment decisions"* and that it may be misleading to draw inferences without recognising how the messages drawn from different "*message spaces*" may interact. Gietzmann and Ireland (2004) test this proposition in a more recent paper that seeks to test how accounting choice affects the relationship between firms' disclosure quality and the cost of equity capital, where 'accounting choice' is categorised as 'aggressive' for firms that have net positive estimated discretionary accruals (DA) and 'conservative' otherwise [3] and estimates of the cost of equity capital are derived using an earnings model, following Hail (2002). Gietzmann and Ireland find, firstly, that firms making aggressive accounting choices have a higher cost of capital, ceteris paribus, than firms making conservative accounting choices. Disclosure quality is measured only by the number of "ti*mely disclosures"*, being the number of formal announcements on the UK Regulatory News Service (RNS) for a sample of 301 UK Information Technology (IT) industry firms over a ten-year period from 1992 to 2002, (IT sector firms are tested because these firms are more likely to adopt aggressive accounting policies and therefore to produce a sufficiently large sample size.)

Secondly and importantly, Gietzmann and Ireland find results that are contrary to the findings of Botosan and Plumlee (2002), who find that more timely disclosures measured by the 'Other Published Information' category of the AIMR rating are *positively* associated with the cost of equity capital. That is, consistent with theory, Gietzmann and Ireland find a significant *negative* relationship between timely disclosure and the cost of capital but *only for firms making aggressive accounting choices*, whereas there is no relationship between disclosure and the cost of capital in more conservative firms. The implication of their findings is that some prior research on timely disclosures (such as that characterising IR communications) that fails to control for relevant correlated variables, or that fails to measure disclosure quality using a focused and 'uncontaminated' measure, may be spurious.

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[3] The estimates of DA are formed by a modified methodology following Jones J. (1991) 'Earnings Management During Import Relief Investigations', Journal of Accounting Research, Vol. 29, 193-228.

In summary, although the direction of the relationship between disclosure and cost of capital is normally predicted to be negative, the results of the empirical literature do not always bear this out. However, because prior literature is limited it probably does not yet provide a sufficient basis upon which to draw conclusions on the existence of a relationship between effective IR and the cost of capital. In addition, the research study described above each employ a different model to estimate the ex-ante cost of capital, they use different methods for measuring the quality of disclosure, test different forms of disclosure and also sometimes only focus on one industry sector, in one market and for one time period. My thesis seeks to overcome some of these weaknesses and to provide further empirical evidence on the relationship between effective IR and the cost of equity capital by using large samples of US and UK firms with effective IR measured across a wide cross-section of industry sectors, over recent time periods, and by employing a robust method to measure the cost of equity.

3.4.6 Chapter summary

This review of the relevant literature shows that there is still a degree of academic debate over which method of estimating the ex-ante cost of capital to should use. For the reasons explained above, this thesis employs the ex-ant Finite Horizon Gordon Divided Growth model, following Botosan and Plumlee (2005). However, it is important to recognise that any model to estimate the ex-ante cost of equity will rely on a specific set of assumptions and, because all models essentially rely on forecasts of future estimates, the certainty of which cannot be currently known, there may not be a 'right' method of estimating the cost of equity capital. In this spirit, Kothari (2001) states that *"It is fruitless to criticise one or more of these models on the basis of the realism of the assumptions"*.

The following chapter reviews the literature relating to the theories upon which this thesis draws and, together with my review of the existing empirical literature provided in this chapter, supports the development of my research hypotheses in chapter 5.

Chapter 4. Theory

Introduction

The previous chapter reviews the existing empirical research that seeks to explore for a relationship between enhanced corporate communications/effective IR and equity returns, analyst coverage and stock liquidity and the cost of equity capital. This chapter describes the framework of theory that further supports the development of the research hypotheses in chapter 5.

Section 4.1 describes the closely related theories of information risk and agency and section 4.2 describes behavioural finance theory. Each of these two sections reviews the relevant literature relating to effective IR that draw on these theories.

4.1 Information Risk Theory and Agency Theory

Introduction

These theories together provide a framework for predicting that effective IR will be associated with future excess equity returns, higher analyst coverage, increased stock liquidity and in a reduced cost of equity capital.

The section is organised as follows. Firstly, the concept of information asymmetry is explained. Information asymmetry is an important concept because it underlies both the theories of information risk and agency. These theories are then described by reference to the existing literature that has used the theory specifically in relation to corporate communications.

4.1.1 Relevance of information asymmetry to IR

The IR function of a firm is a dedicated channel of information from senior management to external shareholders and other stakeholders, and so IR performance is likely to have an impact on the level of information asymmetry and therefore on one of the sources of risk for shareholders that may affect the share price they are willing to pay. Thus it is expected that by reducing this source of perceived risk enhanced IR effectiveness should be associated with future excess equity returns, higher analyst coverage, increased stock liquidity and in a reduced

cost of equity capital and that a steady state of good quality IR should mitigate undue share price volatility and be associated with high stock liquidity and analyst coverage.

4.1.1.1 Information asymmetry

Information asymmetry is caused by the separation of firm' ownership and control, which means that managers inside the firm inherently have superior information about how shareholders' funds are being invested in the business. Information asymmetry is therefore a source of risk for shareholders, the risk that management are not investing their funds in order to maximise future equity returns. If the risk caused by information asymmetry is perceived as high, investors may accordingly discount the share price to compensate for a perceived risk that managers are not disclosing poor business performance that will affect their future returns.

In theory, firms could fully and voluntarily disclose all relevant information to investors to completely eliminate information asymmetry and maximise the firm's share price. However there are good reasons why firms may choose to limit the information they disclose to shareholders. Ross (1989) argues that the level of information that firms actually disclose is the result of a trade-off they make between the related costs and benefits to the firm from doing so.

The most obvious source of cost is the time and effort made by a firm to provide information. However, these costs are unlikely to be large enough alone to deter the disclosure of information. A more important source of cost is any potential damage to a firm's competitive advantages that the information may reveal. Verrecchia (1983) develops a model where firms only have the incentive to disclose news above a firm-specific threshold that is primarily determined by the costs of revealing proprietary information to competitors.

However there are many potential benefits for the firm in disclosing information. Firstly, Dye (1985) argues that a policy of providing frequent and high quality voluntary information may reduce the risk that shareholders perceive that managers are purposefully not revealing some 'bad news' and remove any price discount that

they are imposing to take account of this risk. Secondly, revealing information may reduce the risk of costly shareholder litigation and fines from regulatory bodies, which tend to mostly occur following large falls in share price if investors allege that management have misled them by failing to promptly disclose bad news. Shareholder litigation can also result in intangible costs such as a loss of reputation for both managers and for the firm, although this is hard to measure empirically.

To support this proposition, Skinner (1994) finds evidence that firms issue warnings of negative earnings news more often during reporting periods in which there has been a significant fall in the share price, when there is a higher probability of shareholder litigation. And, in a later study Skinner (1997) also finds evidence that firms subject to shareholder litigation that had pre-empted a bad news earnings surprise by issuing an earnings warning incurred lower eventual costs of litigation.

4.1.2 Information risk theory

Information risk theory is a branch of decision theory focusing specifically on how information asymmetry affects decision-making under risk. Integral to the theory is that rational investors make risky trading decisions in the light of all available decision-relevant information, in order to maximise a desired output. The 'efficiency' of the decision outcome depends on the availability of decision-relevant information. New information that reduces the information asymmetry between the firm and investor affects the investor's decision, and therefore the decision outcome and information-efficiency of the decision.

The Efficient Markets Hypothesis (EMH) embraces this concept on a macro level. Fama (1970) has defined capital market information-efficiency as, "*A market in which prices always "fully reflect" available information is called '"efficient'."* The classic taxonomy of levels of market efficiency is defined by the different degree by which prices quickly reflect the available set of new information, defined by Fama (1970) as follows: 'weak form efficiency', where the relevant information set includes only the history of prices, 'semi-strong form efficiency', where the information set includes all information known to all market participants (publicly available information) and

'strong form efficiency', where the information set includes all information known to any market participant (private information).

For example, if the capital markets are strongly information-efficient, share prices should accurately and immediately impound the implications of all new relevant information, both public information and inside information, at all times.

4.1.2.1 Relevance of information risk theory to IR

If the capital markets are already strongly information-efficient, then there should be no role for IR activities to further affect market prices. The decision to buy or sell equity is a risky decision made in the light of information deemed likely to affect future expected equity returns. Effective IR has a role in affecting market prices only if it enhances market information-efficiency by providing *new information* or *higher quality information* beyond the level already present and known by the market.

There is some empirical evidence showing how the quantity and quality of information can affect a firm's market value. For example Barry and Brown (1985) find that *"low-information"* shares (using the period since they were first listed, the degree of consensus in analyst earnings forecasts and return momentum to gauge the level of information-availability), have higher non-diversifiable risk and that this increased 'information risk' is reflected in higher required equity returns for these firms. Also, Amihud and Mendelson (1989) found that Merton's (1987) Capital Asset Pricing Model (CAPM) cannot fully explain realised abnormal equity returns, but when the model is extended by an "*information factor*", measured by the number of security analysts producing research on the stock, the explanatory power of the CAPM model to explain returns was increased. By improving this "*information factor*" and enhancing the information-availability on a stock, effective IR should reduce perceived risk caused by information asymmetry that is associated with the stock and thereby affect market pricing.

The price impact of new information depends on the *quality*, as well as the quantity, of information. Akerlof (1976) used the second hand car market (coining the phrase "lemons" for a bad deal on a second hand car) to demonstrate how "*quality*

uncertainty" can result in asset mis-pricing. With inadequate information about the real intrinsic quality of a potential purchase, the price of 'good' cars and 'bad' cars (lemons) will converge, since it is impossible for a buyer to tell the difference and assess its fair market value. Applying this concept to the equity market, without information that distinguishes the particular quality of a stock, relatively uninformed investors cannot distinguish which shares are high value or low value resulting in the under-valuation of high quality shares and over-valuation of low quality shares and inefficient investment decisions. By providing 'quality information' effective IR could result in share values that more accurately reflect fundamental fair values.

In summary, information risk provides a theory for expecting that effective IR will be associated with lower perceived risk and a reduced required return on equity capital.

4.1.3 Agency theory

Agency theory concerns risk caused by the *divergence of interests* of the external owners and the managers of a firm due to information asymmetry. Agency theory provides a further theoretical framework for predicting effective IR activities to be associated with future excess equity returns, increased stock liquidity and a reduced cost of capital.

4.1.3.1 Relevance of agency theory IR

Jensen and Meckling (1976) state that "*The relationship between shareholders and the manager of a corporation fits the definition of a pure agency relationship."* Agency Theory recognises that a source of risk for shareholders is that managers may act in their own interests to achieve personal goals such as job security, increased remuneration, career advancement and peer recognition. In the pursuance of these interests, which cannot be monitored by the shareholder without additional costs, the shareholder's return may be compromised. When this risk is perceived to be too high in relation to the return on equity, a shareholder may invest in an alternative asset with a lower risk profile, reducing the market price and liquidity of the more risky share. This firm must then generate a higher return in order to attract this shareholder, resulting in a higher cost of equity capital.

Agency theory is relevant to IR because effective IR should reduce information asymmetry by providing shareholders with information to reduce the level of shareholder-uncertainty and thereby the level of information risk attached to the shares caused by this uncertainty.

Alternatively, effective IR could reduce agency costs for shareholders, which may be high if a firm fails to provide shareholders with sufficient information. To obtain information, shareholders may incur additional costs by using other sources, such as analyst research, a professional advisor or other costly acquisition media. On this basis, because these costs reduce net stock returns, shareholders discount the value of the firm's shares by the expected future agency costs.

4.1.4 Section summary

In summary, effective IR theoretically reduces perceived risks and costs associated with the 'agency problem', reducing required equity returns and the cost of equity capital for the firm and increase stock liquidity.

4.2 Behavioural Finance

Introduction

Behavioural finance provides the theoretical background for predicting that the firms with effective IR are those with prior abnormal excess equity returns and high levels of analyst coverage.

4.2.1 Definition of behavioural finance

Behavioural finance *"applies concepts from psychology to understand and predict the systematic financial market implications of the underlying psychological traits that drive individual investors' and other financial decision makers' actual behaviour and judgement." (Taffler, 2001)*

4.2.2 Relevance of behavioural finance theory to IR

Research described in Chapter 3. show that the equity returns of firms rated in some subjective firm surveys such as the *IR Magazine IR Awards*, show evidence of prior abnormal excess return momentum. Because firms are rated in the *IR Magazine IR*

Award process on their IR performance, which is a practice that largely involves informal relationship-building and face-to-face communications, the ratings are likely to be affected by some behavioural preferences and biases on the part of the respondents in the survey. For these reasons, some of the predictions set out in the theory of behavioural finance are likely to be relevant to the determination of which firms will be deemed to have effective IR. This section describes set of theories that comprise behavioural finance and the relevant literature as it applies to my research.

The implications of behavioural finance are not confined within the boundaries of the discipline of psychology. Its tenets are relevant to any discipline involving decision-making and so it also has implications for understanding the motivations behind decisions made by investors and analysts in the capital markets. This is because behavioural finance recognises that both sophisticated and naïve investors are imperfect decision makers and, when faced with risk, individuals are generally loss-averse and can suffer from sentiments and personal preferences that are carried over to financial decision-making. This means that they may rely on simplifying heuristics/'rules of thumb' and personal biases when making decisions under uncertainty to reduce the complex tasks of assessing probabilities and predicting outcomes to more simplistic judgements (Tversky and Kahneman, 1974).

As stated by Shefrin (2000), "Investors have limited abilities and certain natural modes of behaviour that decide their actions when unambiguous prescription for action is lacking."

Behavioural finance theory has been used to explain certain systematic equity market phenomena that are left unexplained and therefore deemed 'irrational' by traditional finance models and theory. For example, past research has found evidence that the behaviour of equity prices and equity trading differs from that predicted by traditional valuation models and theories on the workings of the capital markets (Core, 2001). Behavioural finance has also been used to explain the psychological motivations of investors during and following the dramatic share price dot.com bubble in the 1990s (Shiller, 2001).

4.2.3 Relevant behaviours identified in the literature

Some of the behavioural traits and predictions identified in the theory are more relevant to the practice of IR, so this section is limited to describing the theory, the literature and the behavioural tendencies, biases and preferences that are most relevant to research using surveys of analysts, investors and firm executives that are similar in nature to the *IR Magazine IR Awards.*

The theory identifies many different heuristic simplifications, or 'rules-of-thumb', that people revert to when making a decision and cannot cope with the volume and complexity of information presented to them. Only the heuristics that are relevant to this thesis are described below.

4.2.3.1 Representativeness

This is the tendency to make judgements based on stereotypes or to assign a higher probability that something is true simply because it is seen as being typical or similar to some other 'known' fact. This comes from a tendency to make assumptions and predictions on the basis of information from a potentially too small or unrepresentative sample.

For example, consider the following description:
"*Peter is a streetwise extrovert who talks quickly and wears smart clothes. Young, bright and dynamic he has a slight East London accent. He works for a large investment bank.*"

When people are asked for the probability that Peter is a derivatives trader the typical response rate is between 20% and 50%, even though the realistic probability would probably be well below 0.5% based on the actual approximate percentage of employees that are derivatives traders. The explanation for this is that the respondents are relating to the *representativeness* of the description rather than standing back and making an objective assessment.

Investors and security analysts may also exhibit this behaviour. For example, if a certain stock has shown a steady rise in price they may intuitively be attracted

towards the share and assume that the price rise is probably directly attributable to good management of the business. In this way the price of the share may come to *represent* 'good senior management', whereas investors and analysts are ignoring the fact that the quality of management and stock price performance are not necessarily at all related.

Likewise, when security analysts are making stock recommendations and earnings forecasts for shares they follow they may be influenced by personal subjective, moral or ethical judgements based on stereotyped past or more recent experiences from investing in similar shares or in similar firms. Some dramatic and more endemic examples of this behaviour are the apparent 'fear' of investing in any *dot.com* shares after the 'bubble' in the share prices of mainly high technology and internet-related firms burst in the late 1990s and in the more recent popularity of investing in funds that target 'socially responsible' or ethical firm stocks.

The representativeness heuristic could also explain the behaviour of some investors who are referred to as 'noise traders'. Noise traders do not act on fundamental research and are the relatively uniformed, unsophisticated investors who tend to choose stocks of firms that they simply regard as 'good firms' and act as if these firms are naturally 'good investments'. Their opinion of what constitutes a 'good' firm may often be only loosely, if at all, related to the traditional attributes that make a share a 'good' investment, but favoured attributes of the firm come to represent attributes about the stock (Shefrin and Statman, 1995).

Investors and analysts may see 'goodness' in characteristics such as a high P/E ratio, low book to market ratio, growth (glamour) shares, small firm size, or even based on the charisma of the senior managers (one could think of Richard Branson for example), depending in their personal point of view or past experiences. Any one, or a selection, of these attributes can then be 'mentally transferred' to generalise about other firm' attributes that are not logically related to the first.

Related to representativeness is the 'halo effect', which *"causes an individual to extend a favourable evaluation of one characteristic of a person or thing to arrive at a*

favourable evaluation of its other characteristics, even where insufficient information about these other characteristics is available." (Shefrin and Statman, 1995).

The form of halo effect that is most relevant to this thesis is the 'financial performance halo'. This is specifically where a firm's previous or recent good financial performance is carried over to 'taint' assessments of other firm' characteristics or attributes. This tendency is likely to be more prevalent for individuals who are primarily concerned about the financial performance of a firm or of investments because it is directly relevant to their professions, such as with fund managers and analysts.

4.2.3.2 Availability

This is the second relevant behavioural heuristic and refers to the tendency to judge an item or event to be more common, and hence more likely to occur or exist, depending on how easily it can be brought to mind (Shefrin, 2000). If something is very familiar, easy to imagine or readily remembered it is seen as being more salient to a current decision. Related to this is the heuristic of 'narrow framing' that causes people to frame problems into narrow, more easily processed, parts.

For example, investors who receive more frequent and useful information about a firm in which they hold shares, whether from the IR function of the firm or from other sources such as broker research, may be more likely to favour this firm because it is more 'available' and easily brought to mind.

Equally if a firm provides its analysts with consistently frequent corporate information the analysts are more likely to develop some preferences towards the firm when assessing it as an investment, simply because this firm's most recent financial performance is made more vivid and is more readily recalled or envisaged, which may lead to its importance being over-weighted in the decision-making processes of the analysts. The higher the number of analysts that cover a firm with more effective IR, the higher the likelihood that this tendency may be operating and so the larger the possible affect on the 'tone' of the analysts' research on this firm in the market place.

4.2.4 Literature applying concepts from behavioural finance to firm surveys

The papers described below are primarily aimed at testing whether the opinions of analysts and fund managers stated in subjective firm surveys appear to show the operation of representativeness, availability and 'halo effects'.

4.2.4.1 *Fortune Magazine 'America's Most Admired'*

This is a highly publicised survey that was first conducted in 1983 and which claims to provide a list of firms that are the 'most admired'. It is based on the results of an annual survey of US senior executives who are asked to rate firms on several qualitative characteristics relating both to the firm and the current management of the firm. Fombrun and Shanley (1990) perform factor analysis on the different *Fortune* survey attributes comprising the 'most admired' index. They find that ratings for many of the attributes are strongly positively related to the firms' prior profitability and strongly negatively related to the firms' prior market risk. The ratings are also highly correlated with recent high media visibility, high levels of institutional ownership, high dividend yield levels and with the level of past expenditure on social and environmental concerns. Fombrun and Shanley conclude that the firms in the *Fortune* list of 'most admired' are simply those that appear to have built up a good *overall "reputation"* based their past performance in some highly visible areas, but that inclusion in the list does not necessarily imply that the firm has performed well in other areas that may be deemed 'admirable' and that has no particular implication for their future performance.

Fryxell and Wang (1994), also testing the *Fortune* data, find that the panel of executives who rate the firms "*appear to cognitively carry over evaluations of quantitative prior financial performance when asked to assess a firm".* They conclude that the panel is implicitly rating the firms in terms of their opinions of it as a past investment vehicle rather than for the more subjective attributes they are asked to assess and that this is an example of the 'financial halo' effect identified in the behavioural finance literature.

Brown and Perry (1994) also detect evidence of a 'financial halo' effect In the *Fortune Magazine* ratings. They construct a 'halo index', based on five financial performance variables of firms in the 1992 survey over the three prior years. They find that the 1991 ratings for each firm characteristic that is assessed for the survey are all significantly associated with the firm's index score and, in their opinion, these objective measures appear to explain the ratings given to the subjective factors subsequently rated in the survey.

Finally, McGuire, Schneeweis and Branch (1990) test whether historical financial performance measures drive the *Fortune* ratings or whether they are more closely associated with subsequent performance. For the firms in the 1983 survey they show that the composite ratings are highly correlated with several measures of prior reported financial performance, both in terms of return-on-assets employed and debt-to-equity ratios, and are also strongly correlated with past market performance measures including equity returns and risk, but are un-correlated with subsequent performance based on any of these measures. They conclude that "... *this study also finds little evidence that the quality of management is an important variable in explaining or predicting future market-based financial performance.*"

4.2.4.2 Association of Investment Management and Research (AIMR)

The AIMR corporate communications rating survey is fully described in section 6.1.1. Lang and Lundholm (1993) explore the relationship between firms' overall ratings in the AIMR survey from 1985 to 1989 and several firm characteristics and their findings are similar to those in the research described above. They find that the AIMR ratings are significantly positively associated with prior risk-adjusted stock returns, the degree of analyst' earnings forecast accuracy, firm size, low equity return variability and are higher for firms with a high correlation between annual returns and earnings and for firms that are more active in issuing securities.

Overall, these findings show that firms receive higher ratings if they are larger, less risky firms and are firms with high performing shares and for whom analysts have a sufficient quality of information enabling them to forecast the firms' earnings

accurately. These findings are consistent with the operation of financial halo, representativeness and availability heuristics.

4.2.4.3 'Excellent firms'

Another body of research focuses on a best-selling and highly influential book which compiled a list of 62 US firms deemed to be at that time the most "excellent", as judged by a panel of senior US executives. The possession of "excellence" was judged in terms of three attributes; 'continuous innovation', 'size', and 'sustained financial performance over the past 20-years' (Peters and Waterman, 1982).

Clayman (1987) tested the equity returns of these firms over the five years following the study to see whether these 'excellent' firms would have represented good investments at the time the book was published. However they found that their stock performance was not significantly different to the performance of the Standard & Poor 500 Index over the same period whereas the performance of a control portfolio of 62 'non-excellent' firms with the worst combinations of the three attributes had outperformed the S&P 500 by 12% per year.

Similarly, Kolodny, Laurence and Ghosh (1989) find no statistically significant difference in the market performance of the firms over the subsequent five years, by comparison to either a market index or to an appropriate control sample of firms. They conclude that the list of 'excellent' firms can be of no future value to investors and that the degree of 'excellence' assigned to them could only have been based on ex-ante information or past, rather than future, performance.

4.2.4.4 *UK Management Today* 'Britain's Most Admired Firms'

Management Today magazine also publishes a 'most admired' list annually, which is similar to the *Fortune Magazine 'Most Admired' survey*, but for is only for UK firms. It is also based on a composite rating of factors that are allegedly 'admired' according to peer firm senior executives and analysts within the same industrial sector.

Blackhurst (2001) tests whether the *Management Today* 'most-admired' firms showed superior performance according to several financial performance measures

over the 12-months following the date the 2000 survey was published. However no evidence was found of significant excess performance by any of these measures and the study concludes that the only value of the survey is as a *"trophy for the senior managers of the firms for a job well done, rather than providing any objective financial information about the firms".*

Agarwal, Brown and Taffler (2004) also test the firms from the UK *Management Today* survey and for the firms deemed to be 'most admired' from 1990 to 2000 they find no evidence of ex-post excess equity returns over the 12-months after being included in the published survey results. In fact, they find that the firms rated highly in the surveyed categories of 'good management' and 'good human resources management' earned *inferior* equity returns in the 12-month ex-post period. Conversely these firms had earned significant excess abnormal returns in the 12-months immediately preceding the survey date.

Agarwal et al. suggest that the firms' prior superior share performance may have largely influenced the ratings given to the firms and that any information that such surveys do contain regarding these firms has probably already been impounded in share prices when the surveys are published.

4.2.5 Summary of behavioural finance theory

The overwhelming conclusions that can be drawn from the findings in the literature described above is that ratings given to firms in these various surveys may be more of a reflection of the firms' past financial performance and of a higher familiarity with these firms by analysts, executives and fund managers giving the ratings, rather than necessarily a direct and accurate measure of the qualities they claim to be assessing. This is consistent with the operation of the 'financial halo effect' and the behavioural heuristics of representativeness and availability described in the theory of behavioural finance.

4.3. Chapter summary

This chapter has described information risk and agency theories that together provide reasons for expecting that effective IR to be associated with higher analyst

coverage, increased stock liquidity and stock prices and to a reduced cost of equity capital.

Secondly, it shows how behavioural finance suggests that factors such as prior superior stock performance and high analyst coverage could influence the ratings of firms on the quality of their IR performance given by the respondents to an opinion survey on these firms due to the behavioural biases of *representativeness*, the *financial halo effect* and of *availability*.

This concludes the chapter describing the theoretical framework of my thesis. The following chapter explains how these theories, and the findings in the empirical literature described in chapter 3 are used to develop the research hypotheses.

Chapter 5. Development of Research Hypotheses

5.1 Introduction

This section explains how I develop my hypotheses to test for any relationships between effective IR and equity returns, stock liquidity, analyst coverage and the cost of equity capital.

Firstly, I develop some hypotheses aimed at contributing to the existing literature described in chapter 3, which provides reasons to expect that effective IR should be associated with excess stock returns and stock liquidity, high analyst coverage and a low cost of equity capital. These are also relationships that are predicted to result from enhanced corporate communications by information risk and agency theories, which I have described in section 4.1. Specifically, these hypotheses test for any subsequent relationships between the number of nominations received by the firms for the *IR Magazine IR Awards* and excess equity returns, increased stock liquidity and analyst coverage and a reduced cost of equity in the years following the time the nominations are made. These four hypotheses are set out in section 5.2 below.

Secondly, other existing literature finds a relationship between the ratings given by third parties in subjective firm surveys, such as the *IR Magazine IR Awards,* and prior excess returns of the firms. As described in section 4.2, these findings are attributed to some behavioural preferences and biases depicted in behavioural finance theory, also described in section 4.2. Behavioural finance also predicts that survey ratings may be higher for firms that have higher 'availability'. Because the respondents to the *IR Awards* survey are probably more familiar with firms that have high analyst coverage, I use the level of analyst coverage as a proxy indicator of higher 'availability'. Therefore, in order to contribute to this literature, I develop two further hypotheses to test for any relationship with prior high levels of analyst coverage and excess equity returns because these factors may determine which firms are subsequently deemed to have the most effective IR in the *IR Magazine IR Awards*. These hypotheses are set out in section 5.3 below.

5.2 The effects of effective IR

Based on the findings of the existing literature described in chapter 3, and for the reasons described therein, I expect effective IR to be associated with future increased analyst coverage, increased stock liquidity and stock prices and with a reduced cost of equity capital.

Information risk and agency theories described in chapter 4 explain that effective IR can reduce perceived equity risk associated with information asymmetry and the 'agency problem', and/or can result in reduced trading costs that create rigidities in equity markets. These theories therefore together provide a framework to explain the relationships with effective IR that I expect to observe.

Based on this, the following null hypotheses are tested in this thesis:

H01: There is no significant relationship between effective IR and ***future excess equity returns.***

H02: There is no significant relationship between effective IR and ***future increased levels of analyst coverage.***

H03: There is no significant relationship between effective IR and ***future increased trading volumes of equity.***

H04: There is no significant relationship between effective IR and a ***future reduced cost of equity capital.***

5.3 The determinants of effective IR

Secondly, other literature described in chapter 4 finds that the superior prior stock performance of firms can influence the firms' ratings in subjective surveys similar to the *IR Magazine IR Awards*. Also, empirical research described in section 3.2 finds that effective IR is associated with increased analyst coverage and, although it is inconclusive over whether high analyst coverage *precedes or follows from* more effective IR, it suggests that high pre-existing high coverage may also be a factor that can influence firms' IR performance ratings.

As also described in chapter 4, behavioural finance explains that any influencing pre-existing factors, such as high analyst coverage and superior stock performance, on the ratings given by respondents in surveys of this type is consistent with the biases of *representativeness*, '*halo effects*' and enhanced *availability* by the survey respondents.

Based on this existing literature and theory, the following null hypothesis are also tested in this research:

H05: There is no significant relationship between effective IR and ***prior excess equity returns.***

H06: There is no significant relationship between effective IR and ***prior high levels of analyst coverage.***

This concludes the chapter on the development of the research hypotheses. The following chapter describes the methodologies employed to test these hypotheses.

Chapter 6. Research Methodologies

Introduction

In the previous chapter I established the hypotheses to be tested. This chapter describes how I construct my dataset of firms with effective IR (section 6.1) and the empirical methods I use to test the firms' equity returns (section 6.2), analyst coverage (section 6.3), liquidity (section 6.4) and cost of equity capital (section 6.5).

6.1 Construction of samples of firms with effective IR

Introduction

This section explains how the samples of firms with effective IR are constructed. Section 6.1.1 discusses the corporate disclosure rating of the *US Association of Management and Research (AIMR)* because this is the main method used in the existing literature to measure the quality of corporate communications, section 6.1.2 describes the method I employ in this thesis to measure effective IR and the reasons why this is a good measure. Section 6.1.3 explains the units of analysis for all my empirical tests. Descriptive statistics of the final samples of firms nominated in all the IR awards are shown in appendix 1 and details of the market values of these firms are shown in appendix 2.

6.1.1 The AIMR corporate disclosure rating

Between 1978 and 1997, the AIMR commissioned an annual survey of sell-side analysts and buy-side brokers and fund managers to obtain ratings on the quality of the corporate communications of a large sample of firms listed in the US. The survey asked respondents to rate the quality of each firm's communications over the past 12-months, in terms three categories; 'Required Published Information', 'Other Non-Required Published Information' and 'Investor Relations'.

Each respondent was asked to give a rating for a pre-defined sample of firms in these three categories of disclosure. The AIMR then calculated an overall rating that is a weighted average of the three category ratings (70% to 80% for Required Published Information, 20% to 30% for Other non-Required Published Information and 10% to 30% for Investor Relations; the precise percentage weighting depended upon a final overall assessment on a yearly basis).

The purpose of this process was to encourage the adoption of more transparent corporate disclosure by publicly announcing the names and overall ratings of the firms each year.

There are several reasons why the use of the ratings in surveys such as the AIMR survey is a valid method to derive a proxy measure for firms' disclosure quality.

Firstly, and primarily, it is probably otherwise impossible to obtain an objective, quantitative measure of a subjective concept such as the quality of corporate communications for a large cross-section of firms over a period of years. Although some researchers have attempted to construct a disclosure index (e.g. Botosan, 1997), this method is hard to replicate, inherently involves a large degree of author-subjectivity and naturally limits sample sizes, due to the time involved to individually assess each firm.

Other approaches rely on firms to self-nominate (e.g. the *UK IRS Investor Relations Web-site Best Practice Awards*), but this intrinsically involves a degree of self-selection bias and automatically excludes some firms that do not self-nominate, although they may nevertheless be regarded in the market as having high quality communication policies.

Secondly, the ratings for the AIMR survey were given by a large number of analysts and fund mangers (covering approximately 1,500 in total per year). Fund managers' and other institutional investors hold the largest percentage of shares in both the UK and US markets and they are therefore one of the main audiences of the corporate IR function and of all forms of corporate communications and information disclosed by a firm. Because of their training, education and experience they normally manage investment portfolios containing high volumes and values of shares across a wide range of firms and industries and so they can be considered as highly sophisticated, with long experience of a wide range of corporate communication activities against which to benchmark. Fund managers will probably also have met personally with senior firm executives and so have the rare opportunity to gauge the personal

communication skills of management and to assess the 'tone' of their IR corporate policy and their attitude towards the quality of their IR function.

Likewise buy-side brokers, employed by fund managers to produce research and/or obtain reports and other information produced by sell-side analysts, and sell-side analysts, normally employed by investment banks, obtain a large part of the information they use from firms' IR departments (either by telephone enquiry, by direct contact or from the firm IR web-site or 'information pack') and may also be present at meetings held for fund managers with senior executives.

It is in this role as key information intermediaries in the capital markets that analysts and brokers are also perhaps in a prime position to give first-hand opinions on the quality of a firm's communications.

Another justification for using the AIMR ratings as a proxy measure for quality of corporate communications in earlier research is that, at that time, there was probably no alternative similar survey that produced a measure of the precise variable that researchers were interested in. The AIMR survey covered a large number of firms over many years, and so provided researchers with a consistent measure for a large cross-section of listed firms. Finally, because parties who are independent of both the firms and the researchers gave the ratings, this reduced the risk of any biases in the measure due to any pre-existing relationships and of any biases that may affect the measure due to researcher-subjectivity.

6.1.2 The *IR Magazine* IR Awards

In this thesis the number of times a firm is nominated for the *US and UK IR Magazine IR Awards* is used as a measure of the effectiveness of their IR policy.

Importantly, using the *IR Magazine IR Awards* as a proxy construct measure constitutes an original contribution to the IR literature, as it has never been used before in published research. Uniquely, it covers both US and UK firms, whereas the AIMR communications rating was limited to US firms only, and is a pure measure of

only IR performance, whereas the AIMR rating was a composite measure of which IR only comprised a maximum 30% weighting.

Further, for each annual survey the AIMR pre-defined a population of the largest listed US firms to be rated by panels of analysts, whereas *the IR Magazine* ask a wide sample of respondents to name any listed firms they consider to have the best IR performance and these firms constitute the population of firms. The *IR Magazine* data may therefore be viewed as superior data because it does not have this intrinsic pre-selection bias. Also, the AIMR ceased the survey in 1997, the data has been used extensively in past research and is now also out-of-date.

Also, use of survey data by *IR Magazine* to measure the quality of corporate disclosure is further justified because it follows the use of survey data in some of the key empirical research papers that have tested the relationship between effective corporate communications and firm performance, for example Healy et al. (1999) and Botosan and Plumlee (2002), which both use the US AIMR survey data. The use of the I*R Magazine* data to measure IR performance therefore follows an established research method for measuring a construct that is probably otherwise impossible to objectively measure.

This problem of finding a reliable method to quantitatively measure a 'soft' variable such as IR performance is not uncommon in empirical research and is normally solved by using a proxy measure as a 'best estimate'. IR managers presumably regard the IR awards highly and may themselves use the winning of the award as a method of gauging and benchmarking their IR performance from year to year. Some support for this can be seen on the corporate websites of past winners, which testify to their achievements in the *IR Magazine Awards* and also informal feedback from award-winners that I have received during the process of this research testify the esteem they give to winning an award.

I did consider other alternative proxy measures, but these are now not available or are not regarded as suitable for the purposes of my research. The Standard & Poor (S&P) Global Transparency and Disclosure Survey only commenced in 2002 and

therefore did not provide a sufficient number of years' data history. Another alternative was the *Extel* Investor Relations firm' rating but the sample sizes and history of the survey likewise did not match those available from the *IR Magazine* data.

Because the methodology and process followed to derive the ratings are deemed robust, the *IR Magazine* data is also a robust and 'clean' measure of the quality of IR. Also, the survey process and methodology, including the number and type of respondents, is publicly published with the award results in a report, so there is further reassurance that the survey is conducted in a reliable way and consistently across years. Also, as the research is conducted by independent research agencies and so the identity of the firms who win the awards are unlikely to be biased by any preferences on behalf of these agencies. In addition, because the respondents include buy-side analysts and fund managers as well as sell-side analysts (a break-down of respondents is shown in tables I and J in appendix 1), there is a lower risk that the responses are influenced by any pressures to vote for corporate finance clients; a pressure that may only apply to the sell-side analyst.

The *IR Magazine* only publishes the identity of the three firms with the highest number of nominations, whereas my research is able to use the full underlying data covering all survey responses in their raw form, and so enables a wider-ranging analysis than that possible by public scrutiny. Finally access was attained to the full list of firms and number of nominations for all years 2000 to 2002 from the US and 1999 to 2002 for the UK, the result are large sample sizes of firms across a wide cross-section of industry and over several years.

6.1.2.1 Derivation of the IR-effectiveness rating

The IR rating assigned to each firm is simply the number of times each firm is individually nominated by different respondents. Although all nominations are for firms that the respondent considers to be the 'best' in a particular category of IR, some firms are only nominated once as being the 'best', whereas other firms may receive a nomination from many different respondents. The majority of the firms are only nominated once, although there is a sufficient range in the number of

nominations across the firms so that the range of IR ratings is sufficiently large to enable a cross-sectional analysis.

6.1.2.2 The *IR Magazine* award nomination process

For over a decade the *US and UK IR Magazine* have commissioned independent research firms to manage the process of obtaining nominations for the listed firms that are deemed to be the "best" in several distinct categories of IR. IR awards are then presented to the firm with the most nominations in each IR category, with the two runner-up firms being named as "commended". The identity of all other nominated firms is not publicly disclosed. Although firms may be nominated if they do not have a listing on the stock exchanges in the country in which the awards are made, nominations are only obtained from sell and buy-side analysts and fund managers operating in the awarding country.

Because I aim to provide more up-to-date empirical evidence I only use recent nomination data. For the UK firms I use survey data obtained by *Fulcrum Research* from 1999 to 2002 and for the US firms I use the data obtained by the research firm *Erdos & Morgan* from 2000 to 2002 (the US research was conducted by another research firm prior to 2000 and access to prior data was not available). The methodologies used by the US and UK research firms for collecting the IR award nominations are very similar. Each nominee is asked to nominate a firm by completing a questionnaire that is sent by fax or email or completed by telephone interview. The aim is to obtain responses from as many respondents as possible amongst the US/UK fund managers and buy-side and sell-side security analyst and to cover a wide range of industry sectors and investment specialisations, by both covering as many respondents as possible but also by encouraging all interviewees to nominate firms outside their specialities to which they have had experience of their IR performance over the preceding 12-months.

The source population respondents in both the US and the UK are fund managers and sell and buy-side analysts from each of the financial institutions listed in the *Thomson Financial I/B/E/S* database (UK) *and Barron's* and *WILink* databases (US). For all awards in both the UK and US the nomination data-collection process takes

place during the month of March and is finalised on 31st March. Interviewees are reminded that all nominations should relate to IR activity and/or events that occurred in the 12 months from 1st April in the prior year to the 31st March of the current year, although it is impossible to check whether they are able to confine their opinions in this way. The final number of respondents by type and by industry sector speciality is recorded and publicly disclosed in each of the annual published '*IR Magazine IR Award Reports*' that are issued shortly following the awards themselves. The final number of nominations is constrained by time restrictions because no nominations are accepted after 31st March. Although the IR awards are presented to the winning firms in July each year in both countries, because the award nominations are finalised on 31st March, **this is an important date because it determines the time periods for which I obtain the empirical data for my tests of the firms, which are described in chapter 6.**

6.1.2.3 UK IR rating

Because the distribution of UK respondents' industry specialisations (which is also recorded as part of the survey) is very unevenly spread, the measure of effective IR for the UK firms is the number of nominations they receive but it re-weighted by a factor to 'correct' for the fact that if a firm is in an industry sector index that is covered by more of the respondents, it is more likely to be nominated compared to an industry that is followed by a small number of analysts. The re-weighting is aimed at removing any influence from this industry bias. This factor is the ratio of the number of respondents specialising in a firm's industry sector divided by the total number of respondents in each annual survey across all industry sectors.

6.1.2.4 US IR rating

The re-weighting exercise is not considered necessary for the US data because there is a very even distribution of industry sector representation in the respondents. The US IR rating is therefore simply the number of times each firm is nominated for each IR award category. Because the US firms and UK firms are not combined into one sample for any of my empirical tests, this difference in method will not affect any of the results.

6.1.2.5 The Key IR Awards

IR Magazine awards US and UK firms in distinct categories of IR performance that reflect the many aspects of an effective IR program and also to recognise the IR efforts of firms in special circumstances, such as during a take-over. A full listing of all these IR award categories are set out in tables A, B and C in appendix 1 in this thesis.

This research only uses the award categories considered to provide the best and key representations of effective IR and which have sufficiently large sample sizes so that the results are more generalisable. In the case of the UK firms, the samples for all the empirical tests relate to the firms nominated from 1999 to 2002 for the 'Best UK IR Officer', 'Best UK Results Meetings with Fund Managers and Analysts' and 'Best UK IR Communications of Information in the Annual Report'. The US samples are all firms nominated for the 'Best US Overall IR for a Large Firm' (over $3bn market capitalisation at year-end ending in the year of the award) and 'Best Overall IR for a Small Firm' (under $3bn market capitalisation), although as indicated above it was only possible to obtain access to the US IR award data from 2000 to 2002. A summary table of the sample sizes of US firms and UK firms I test in my thesis is set out below, with full descriptive statistics shown in appendix 1.

US awards for 'Best Overall IR'

Award/Year	**2000**	**2001**	**2002**	**Total**	**Av. MV[4]**
Large Firms	361	216	482	**1,059**	19,320
Small Firms	1,024	409	621	**2,054**	685
Total	**1,385**	**625**	**1,103**	**3,113**	

UK IR awards

Award/Year	**1999**	**2000**	**2001**	**2002**	**Total**	**Av. MV**
Best IR Officer	65	95	131	170	**461**	10,810
Best Results Meetings	63	95	114	140	**412**	11,748
Best Annual Report	59	81	101	140	**381**	13,784
Total	**187**	**271**	**346**	**450**	**1,254**	

[4] AV. MV is the mean market value (£'000s) across all of the firms nominated for the relevant IR award at 31st March in each of the IR award years 1999-2002/2000-2002 as applicable.

6.1.2.6 US IR awards

For this research the US IR Award for 'Best Overall IR' is tested because this category is considered to provide the best summary measure of IR-effectiveness and applies to the widest possible range of listed firms. Also, because it is specifically targeted at identifying the 'best' large and 'best' smaller firm, it allows explicit tests that recognise the effect that firm size may have on the effectiveness of IR.

6.1.2.7 UK IR awards

In the UK IR Awards there is not a category for 'Best Overall IR' and the firms nominated in three key IR awards form the sample firm' populations. The reasons for choosing these three award categories of IR are described below.

i. Award for the Best IR Officer/Manager

This is probably the best category for providing a measure of overall IR performance and is the closest UK category to the US award for 'Best Overall IR'. This is justifiable because the award for Best IR Officer is both a personal recognition for the IR manager who wins the award and also recognition of the efforts of the firm's senior management, who are responsible for determining the corporate IR policy and appointing the IR manager. An IR manager can only be effective with the support of an effective IR department, and with effective internal communication systems and processes.

ii. Award for the Best Results Meetings with Fund Managers and Analysts

This category is for an event that is perhaps one of the key IR events in an annual IR program. Firms normally issue final and interim financial results to the market at a pre-determined date through an authorised channel. In the UK this is via a Primary Information Provider (PIP) approved by the FSA and in the US this is to the Securities and Exchange Commission (SEC). This mandatory formal announcement is normally followed-up shortly afterwards with results meetings with key investors, analysts and media.

The meeting is for the senior managers (the Chief Executive, Chairman and Financial Director are normally always present and sometimes the IR manager in person) to invite their main investors, the most active security and industry analysts

and in some cases some key financial reporters, to a formal event and to personally present the latest financial results. The IR personnel will normally be heavily involved in the preparations for this meeting and may take a supportive role by dealing with any follow-up calls and enquiries.

The purpose of these face-to-face meetings is for the senior managers to present in person the firm's financial performance, how this has been achieved, to explain how performance varies from their previous forecasts and strategies and forecasts for future performance and how these will be achieved. A meeting is also an opportunity for the senior management to put a 'human face' behind the financial figures and to portray their personal managerial qualities, with the hope of engendering trust and credibility to investors and analysts through an informative and enthusiastic presentation. Increasingly the value of board members must be explained and demonstrated at these meetings because institutional investors place a growing importance on corporate governance issues. Importantly, the meetings can also give management an important source of feedback on how their performance is being received by the market.

For the audience, the meetings are an opportunity to ask focused questions of management about issues that concern them and to use any information obtained to refine their assessments over their own forecasts of firm performance. The meetings are therefore a two-way communication process with all parties providing input.

In addition to being a major IR event, this IR category is used in this research to contribute to the existing literature that has found empirical evidence of the importance for listed firms to communicate effectively at meetings with their analysts and key investors. For example, Holland (2002) conducted interviews with executives and their largest shareholders and analysts and found that the private meetings between analysts and firm executives were considered by both parties to be one of the most important channels of communication.

There is also past research showing why firms might be concerned with maintaining good communications with security analysts, finding evidence of a significant positive

impact on share prices shortly after analyst-firm meetings suggesting that they are an important source of new information for investors (e.g. Walmsley, Yadav and Rees, 1992). Other research has also found that previously under-performing shares earn positive excess returns immediately after the firm concerned made a personal presentation to analysts and brokers and that the number of earnings forecasts produced by analysts for these firms also increased, indicating that useful and valuable information may have been revealed during the meetings that they disseminate and is absorbed by investors (Francis, Hanna and Philbrick, 1997).

iii. Award for Best Annual Report IR Communications

This award is not made only for the contents of the annual report, but for how effectively a firm communicates the information it contains is explained and interpreted by the firm to the market and for exceptional value-adding information shown in the annual report that exceed mandatory reporting requirements.

The format and content of the UK and US annual report has evolved over time in accordance with accounting and reporting regulations (by the UK Accounting Standards Board (ASB) and the US Financial Accounting Standards Board (FASB)), and to meet the requirements of UK and US Company Law. However, firms are encouraged to provide any additional disclosures in their annual report that will assist stakeholders in understanding the financial performance and position of the firm. This is probably mainly driven by 'best practice reporting standards' determined by peer firms. Annual reports are also increasingly aimed at a wider range of stakeholders, including employees, environmental lobbyists and others.

The annual report normally provides a great deal of information beyond the financial statements. This information may be detailed financial ratios, graphical presentations of performance indicators, narrative on the firm's business divisions, industry trends, management and employees and increasingly on corporate social responsibility (CSR) and environmental policy. The annual report is therefore an opportunity for management to explain in a clearly presented and 'user-friendly' format their assessments on the past period's performance and their plans and strategies for the future.

There is evidence that the annual report is still used by most investors and analysts as a primary source of firm information. This view is supported by evidence obtained from interviews with 100 of the top fund managers and their analysts by the firm that conducted the research for the 2003 UK *IR Magazine* IR awards. The *2003 IR Magazine UK Research Report* includes a section that summarises the responses from a focused questionnaire to 100 buy and sell side analysts and fund managers. It shows that 54% of the sell-side analysts asked said that the annual report was their most important source of information, followed by meetings with management (45%) and websites (22%), with all other sources given a much lower priority. Annual reports were also the most frequently mentioned source of information by buy-side analysts and fund managers (73%), followed by firm websites at only 27%. The annual report as a key source of information has also been ranked highly in all of the equivalent Research Reports in 1999, 2000, 2001 and 2002.

There is also some empirical research evidence that the annual report is a key source of information for security analysts. For example Hope and Pope (2003) show that firm disclosure level is positively related to earnings forecast accuracy, suggesting that the disclosures provide useful information to analysts. This is based on tests of the relationship between analysts' earnings forecast accuracy and the level of annual report disclosure in 22 countries, where the level of disclosure is measured against local GAAP.

Meanwhile, other research by Eccles and Mavrinac (1995) concludes that the annual report is not sufficient alone in supplying investors and analysts with all the information they need. For example, from a survey of senior executives, analysts and fund managers, Eccles and Mavrinac (1995) find that there is a fundamental expectations gap between the information that firms are required to disclose in their annual reports and that required by the market. However, the survey respondents attribute the cause of any 'gap' more to a failure by senior management to adequately *present and communicate* the information in the annual report, rather than to a weakness in reporting regulations per se.

Also, in a more recent publication Eccles, Herz, Keegan and Phillips (2001) claim that the responses from a similar opinion survey of managers and analysts about the annual report, produced in conjunction with Price Waterhouse Coopers (PWC), provides overwhelming evidence that the annual report is still insufficient at providing investors and analysts with the information they require. The respondents in this survey say that the two main problems with the current financial reporting model are, firstly, an over-focus on top-line earnings results and secondly the persistent failure of firms to meet the information 'gap'. Firms are described as playing an "earnings game" with their investors and analysts, which encourages analysts to increasingly focus on the short-term performance and for the market to place too much importance on how reported earnings compare to analysts' expectations of earnings. The respondents suspect that managers are "managing earnings expectations", because they are very aware of how the market dislikes 'earnings surprises'. In fact, both managers and analysts can benefit from fewer earnings surprises because it gives the impression that analysts are knowledgeable and that management are doing their jobs well. The main areas where they perceive an information gap is a failure by some firms to report information that managers regard as important and use to manage the business, unreliable information due to weak internal reporting systems and lastly a failure of managers to even appreciate that the market is not receiving the information it requires and probably comes from a failure to pay attention to market feedback. In summary, these findings show how important it is for firms to make efforts to provide information beyond simply producing an annual report that meets the minimum of legal and accounting reporting standards and to respond to questions and queries form their investors and analysts and to listen to market feedback.

Despite this, however, another reason for my thesis to test the annual report IR category is because Botosan and Plumlee (2002), in one of the key research papers upon which this research builds, find a positive and significant relationship between the rating given to firms for their 'Required Published Information' (including the annual report) in the AIMR survey and the cost of equity capital. The testing of the 'Best Annual Report IR Communications' *IR Magazine IR Award* therefore allows a comparison with the findings on US firms in this prior literature.

6.1.3 Units of analysis

6.1.3.1 By IR award

The IR award categories I test are as follows:

UK

- Best IR Officer
- Best Results Meeting with Fund Managers and Analysts
- Best IR Communications of Information in the Annual Report

*US (note: t*he US firms are analysed both by large and small firms separately and then by combining the large and small firms into one sample of firms).

- Best Overall IR for a Large Firm (over $3bn market capitalisation at year end)
- Best Overall IR for a Small Firm (under $3bn)

6.1.3.2 Portfolio formation

All firms - For all of the empirical analyses that test for a relationship between the firms IR rating and equity returns, analyst coverage, liquidity and cost of equity capital, the tests are performed within the cross-section of all nominated firms in each IR award, by dividing the firms into portfolios in a consistent manner, as follows. The samples of all firms nominated for each annual IR award are divided into three portfolios (P) based on the break points of the rank percentage of the number of nominations each received. In all cases portfolio 1 comprises rank 100%-66.7%, portfolio 2 66.6%-33.4% and portfolio 3 33.3% - 0.001%. The three groups are then pooled across years (1999 to 2002 for the UK and 2000 to 2002 for the US) to result in three pooled portfolios 1,2 and 3 for each award category, where portfolio 1 contains firms with the highest number of nominations. Appendix 1, table F (for UK firms) and table H (for US firms) show the resulting numbers of firms in each portfolio.

Cost of equity capital tests – applying to all firms - For only the cost of capital tests, all firms are divided into portfolios in the two following ways. All firms nominated in each annual IR award are firstly ranked on their within-year IR rating and then divided into 3 within-year portfolios based on:

- The 33% / 66.6% percentage break-points of ranked IR rating (as above) and;
- By allotting an equal number of firms to each portfolio.

Portfolios 1, 2 and 3 are then pooled across the IR award years to result in three larger across-year portfolios for each IR award.

Cost of equity capital tests - US firms. Compared to the population of respondents in the UK *IR Magazine* IR awards survey, the population of US fund managers and analysts who are asked to nominate firms is much larger. This is probably essentially because there is a larger overall population of security analysts and fund managers in the US market. However, although this means that the ratings for a US firm is likely to be higher than for a UK firm simply because of the higher number of survey respondents, the UK and US firms are not combined in any of the empirical tests so this does not affect any of the test results. Further, whereas the distribution of the number of award nominations across the UK firms is quite evenly spread, the majority of the US nominations are highly skewed towards a small number of firms. Due to this skew-ness the cost of capital results for the US firms are further analysed by dividing all nominated firms into 10 portfolio groups and then pooling the portfolios across the award year, where the portfolios are formed by:

- 10 percentage rank break points based on the IR rating and;
- By dividing the total number into 10 groups containing an equal number of firms.

Section 6.5 provides the methodology I adopt to measure the cost of equity capital.

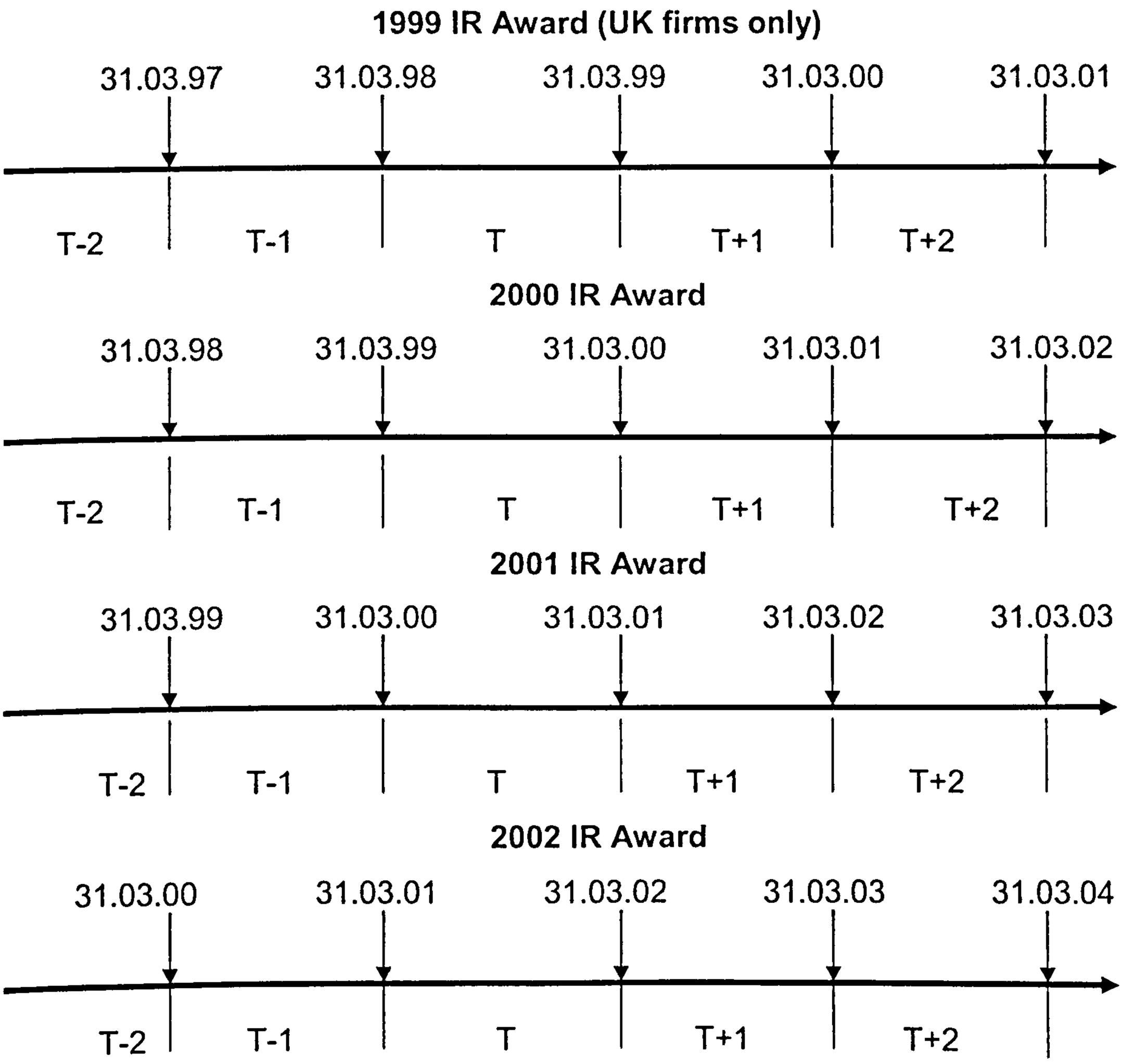
Analyst Coverage US firms – For reasons I have just explained, for the tests on levels of analyst coverage the US firms are also divided into both 3 and 10 portfolios, where 3 portfolios are based on the decile break points of ranked percentage of number of nominations from 100%-66.7% (portfolio 1), 66.6% to 33.4% (portfolio 2) and 33.3% - 0.01% (portfolio 3) and 10 portfolios are formed by dividing the total number of firms into 10 group containing an equal number of firms. Refer to section 6.3 for further description of the tests on analyst coverage.

6.1.3.3 Time periods analysed

Because the portfolios are formed within each annual IR award and then pooled across years into three large portfolios 1/2/3, they may contain firms that have been nominated for the award in only or one more years 1999 to 2002. In order to test how the firms' equity returns, equity trading volumes, cost of capital and analyst coverage are related to the firm's IR rating in the years surrounding the specific month in which the firm is nominated, it is important to maintain the identity of the

year of nomination within the portfolios. **To do this, each 12-month period immediately preceding the end of March in each IR award-year is referred to as year T throughout all the tests in the thesis.** For example, the firms nominated in portfolio 1 in 1999, the period 1st April 1998 to 31st March 1999 is the period T and for those in portfolio 1 in 2000 period T is 1st April 1999 to 31st March 2000. This pattern is also used for the 2001 and 2002 nominated firms. Accordingly, periods T-2, T-1 are the consecutive 12-months periods preceding T, and periods T+1 and T+2 are the consecutive 12-months following T. This is more clearly shown thus:

Chart of empirical data-collection periods for firms nominated for an award for their IR performance during the 12-month period ending 31 March in period T



Methodologies for empirical tests

The following sections describe the methodologies employed for the empirical tests of my research hypotheses that I developed in chapter 5 and are summarised below.

Section 6.2 describes the methodology used for testing my null hypotheses relating to the firms' equity returns:

H01: There is no significant relationship between effective IR and ***future excess equity returns.***

H05: There is no significant relationship between effective IR and ***prior excess equity returns.***

Section 6.3 describes the methodology used for testing the null hypotheses relating to the firm's analyst coverage:

H02: There is no significant relationship between effective IR and ***future increased levels of analyst coverage.***

H06: There is no significant relationship between effective IR and ***prior high levels of analyst coverage.***

Section 6.4 describes the methodology used for equity trading volumes null hypothesis:

H03: There is no significant relationship between effective IR and ***future increased trading volumes of equity.***

And, finally, section 6.5 describes the methodology used for testing the cost of equity capital null hypothesis:

H04: There is no significant relationship between effective IR and a ***future reduced cost of equity capital.***

6.2 Methodology for testing for a relationship between IR and equity returns - null hypotheses *H01* and *H05*

6.2.1 Risk-adjusted returns

Firstly, an analysis is conducted to see whether the firms, which represent *'firms with effective IR'*, earn significant abnormal prior or subsequent risk-adjusted returns during the 12-months prior to and subsequent to the month of nomination for an IR award. Firms are tested by pooling the firms nominated in each IR award for 'Best Overall IR – Large Firm' and 'Best Overall IR – Small Firm' separately across years 2000 to 2002 for the US IR award and by pooling the firms nominated in each of the 3 UK IR awards, 'Best IR Officer', 'Best Results Meeting' and 'Best Annual Report' separately across years 1999 to 2002.

Firms' monthly returns are calculated for the 12 prior months (period T) and 12 subsequent months (period T+1) and are then risk-adjusted as described below in section 6.2.3 (period T and T+1 are as defined in section 6.1). This results in 36 prior monthly returns and 36 subsequent monthly returns for the pooled US firms nominated for 'Best Overall IR' 2000 to 2002 and 48 prior and 48 subsequent monthly returns for the pooled UK firms nominated in the three UK award categories 1999 to 2002. Finally, regression analysis, described below in section 6.2.3, is performed.

6.2.2 Portfolio risk-adjusted returns

My second analysis relates to the monthly risk-adjusted returns within the cross-section of firms during periods T and T+1 and both tests for significant abnormal equity returns and also tests for any relationship between the firms' risk-adjusted returns and their IR rating. The portfolios are constructed as described in section 6.1.3.2, resulting in 36 prior monthly returns and 36 subsequent monthly returns *for each portfolio* of US firms (for award years 2000 - 2002) and 48 prior/subsequent monthly returns *for each portfolio* of UK firms (for award years 1999 - 2002) for the pooled samples of firms. The portfolio monthly returns are the averages of the monthly buy-and-hold returns of the firms in each respective portfolio. Regression analysis is then performed for each portfolio, as shown below in section 6.2.3.

6.2.3 Risk-adjusting model

Equity returns are tested using the Fama and French (1993) three-factor model in two-tailed tests for whether the firms earn superior prior or subsequent risk-adjusted returns, augmented by the momentum factor[5]. The resulting model therefore adjusts the firms' buy-and-hold returns for the risk-free rate and also controls for risks associated with firm size, book-to-market value, and prior momentum, as shown below:

$$R_{P/it} - R_{Ft} = a + b\,(R_{Mt} - R_{Ft}) + s\,SMB_t + h\,HML_t + m\,MOM_t + \varepsilon_t \qquad (1)$$

where:

a = the intercept term and b, s, and m are the coefficients on the risk factors,

R_{Pt} = the buy-and-hold return of the firms in portfolio P/firm i during month t,

R_{Ft} = the risk free rate (US/UK one- month Treasury bill rate) at the start of month t,

R_{Mt} = return on the relevant market portfolio in month t,

SMB_t = return on the mimicking portfolio for the size factor in month t,

HML_t = return on the mimicking portfolio for the B/M factor in month t,

MOM_t = return on the mimicking portfolio for the momentum factor in month t, and;

P = 1,2 and 3 (portfolios are constructed as described in section 6.1)

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[5] In order to test the sensitivity of results to the inclusion of the momentum factor, a second regression analysis is run that controls only for size, book-to-market and market risk factors. Because the empirical results for US firms are not significant under this second analysis, they are not reported in this thesis. However, the results UK firms differ from those reported in section 7.1 below as follows. Across all firms nominated in the three IR award categories, whereas there are some significant results reported in section 7.1 for the prior period T, the results using this second analysis are insignificant. Also, whereas the results reported in section 7.1 for the following period T+1 are insignificant, using this second analysis the firms nominated for Best IR Officer and Best Results Meeting earn significant negative abnormal returns (both of approximately 3% per month, t= -2.10 and t= 2.01 respectively). Further, the tests of returns by portfolios of firms in these two IR award categories that exclude the momentum factor show that only firms in portfolios 1 and 2 nominated for Best IR Officer earn significantly negative returns (portfolio 1 at 2% per month, t = -2.23, portfolio 2 at 2% per month, t = -2.10) and only firms in portfolio 3 in the Best Results Meetings category earn significantly inferior returns (at 2.47% per month, t = -2.60).

ε is the error term and HML, SMB and MOM are constructed as described below at 31st of March of each year.[7]

Monthly buy-and-hold returns for the US and UK firms are obtained from the *Thomson Financial DataStream* database and the risk factors are calculated as described below. To interpret the results, the coefficient (a) indicates the size of any risk-adjusted returns of each group of firms/portfolio of firms in periods T and T+1 and the t statistic indicates the two-tailed statistical significance of the firms' risk-adjusted returns.

Construction of SMB, HML and MOM risk factors

US firms

For the US firms, monthly SMB, HML and MOM factors are taken from the *Kenneth French* web site for the relevant months.[6] The Fama and French (1993) benchmark factors, R_M, SMB, and HML, are constructed from six size/book-to-market benchmark portfolios that do not incur transaction costs. R_M, the excess return on the market, is the value-weighted return on all NYSE, AMEX, and NASDAQ stocks (source: *CRSP*) minus the one-month Treasury bill rate (source: *Ibbotson Associates*). SMB (Small Minus Big) is the average return on three small portfolios minus the average return on three big portfolios:

SMB = 1/3 (Small Value + Small Neutral + Small Growth)
- 1/3 (Big Value + Big Neutral + Big Growth) ***(i)***

HML (High Minus Low) is the average return on two value portfolios minus the average return on two growth portfolios:

HML = 1/2 (Small Value + Big Value) - 1/2 (Small Growth + Big Growth) ***(ii)***

The book-to-market ratio is high for value stocks and low for growth stocks

.MOM is the average return on the two high momentum portfolios minus the average return on the two low momentum portfolios:

MOM = 1/2 (Small High + Big High) – 1/2 (Small Low + Big Low) ***(iii)***

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6 (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/).

7 31st March is used because in the UK and US the IR award nomination process occurs during March each year to a strict deadline that is required so that the 'winners' can be announced in July each year.

UK firms

R_{Mt} for the UK firms is the monthly return on the FTSE All Share index and because there is no similar access to a source of data on UK risk factors relating to firm size, book-to-market and momentum, these are calculated employing the methodology used by Agarwal, Brown and Taffler (2004) as follows. Firstly, all stocks listed on the London Stock Exchange for the entire period commencing 1st April 1998 to 31st March 2003[7] are identified from the London Share Price Database (LSPD). Because the firms in the IR award samples include financial firms these are not excluded from the LSPD population. The firms are then ranked on the basis of their year-end market value/capitalisation (MV) at the close of each 12-month period ending 31st March and grouped into two portfolios, using the median size as the breakpoint. The portfolio with the lower 50% of market capitalisations is designated portfolio S (small) and that containing the other 50% of stocks is designated portfolio B (big).

The firms are then independently ranked on their book-to-market value (B/M) [8]at the close of each 12-month period ending 31st March and grouped into three portfolios, the lowest 30% (portfolio L), middle 40% (portfolio M) and highest 30% (portfolio H). SMB and HML are constructed, as by Fama and French (1993), by forming six portfolios from the intersections of the two MV and three B/M groups: small/low B/M (S/L), small/medium B/M (S/M), small/high B/M (S/H), large/low B/M (B/L), large/medium B/M (B/M) and large/high B/M (B/H). Factor SMB is constructed as the difference between the simple average of monthly returns on the three small stock portfolios and the simple average of monthly returns on the three large stock portfolios, i.e.:

$$\mathbf{SMB = ((S/L + S/M + S/H) - (B/L + B/M + B/H)) / 3} \qquad \textit{(i)}$$

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[8] Book values are sourced from Company Analysis (CA) database. Book values are taken as the value reported in CA at the firm's nearest year-end falling in the 12-month period preceding each 31 March 1999 to 2002. The data was not amended to reflect the fact that for firms reporting shortly after end March, book values would not have been known at 31 March, and therefore may incorporate an element of 'hindsight bias'. It is assumed that this will occur in only a small number of cases and so will not materially affect the empirical results relying on these book values.

Factor HML is constructed as the difference between the simple average of monthly returns on the two high B/M portfolios and the simple average of monthly returns on the two low B/M portfolios, i.e.:

HML = ((S/H + B/H) – (S/L + B/L)) / 2 ***(ii)***

The momentum factor MOM is calculated by forming six value-weighted portfolios formed on market capitalisation and prior returns. The portfolios, which are formed monthly, are the intersections of 2 portfolios formed on size (MV) and 3 portfolios formed on equity returns over the 11 prior months commencing at the 12th prior month. The monthly size breakpoint is the median market equity valuation of the full sample in the LSPD. The monthly prior return breakpoints are the 30th and 70th LSPD percentiles.

Finally, MOM is the average return on the two high momentum portfolios minus the average return on the two low momentum portfolios, as follows:

MOM = ½(Small High + Big High) – ½(Small Low + Big Low) ***(iii)***

This concludes the section describing the methodology for testing the firms' equity returns. The test results are shown below in chapter 7, section 7.1.

6.3 Methodology for testing the relationship between IR and analyst coverage – null hypotheses *H02* and *H06*

6.3.1 Introduction

As described in the literature reviewed in section 3.2, prior research suggests that firms can benefit from the effects of high analyst coverage. Further, this literature finds that analysts appear to be more attracted towards some firms, which have characteristics such as large size and low risk, more than others. This section describes the methodology for testing the relationship between a firm's IR performance and levels of analyst coverage and seeks to test whether the firms' IR rating is also a factor that is associated with high analyst coverage. These analyses specifically control for firm size, which is measured by market capitalisation at 31st March in the year in which the firm is nominated for an IR award. Firm size is relevant because prior research has shown that levels of analyst following are positively correlated with market value, as described in section 3.2.

6.3.2 Measure of analyst coverage

Levels of analyst following are measured by the number of analysts publishing earnings, price and growth forecasts for the firm at the end of each calendar year 1998 to 2004 in the *Thomson Financial FirstCall, I/B/E/S* databases. The use of this database as a reliable source of information on analyst coverage follows an established research method (e.g. Shefrin and Statman, 2004)

6.3.3 Analyses

6.3.3.1 Portfolios of firms

The first test is of the mean number of analysts of each firm at the end of T-2, T-1, T, T+1 and T+2, where the US and UK firms nominated in each US and UK IR award are divided into three portfolios, following the method described in section 6.1.3.2. For reasons, also explained in section 6.1.3.2, mean analyst coverage for the US firms is also analysed by dividing the firms into 10 portfolios.

6.3.3.2 Regression analyses

Secondly, regression analysis is performed to test for any relationship between 'sfirm's IR rating and analyst coverage across all US firms and UK firms nominated

in each IR award, controlling for firm size (market capitalisation at year-end ending in the year of the award period T-2, T-1, T, T+1 and T+2). The aim is to test how levels of analyst following in the years T-2 to T+2 are related to effective IR. This is done firstly in a regression test whereby analyst following is the dependent variable, as shown in equation 2 (a) below, to test for how effective IR (as measured by the IR ratings) may affect levels of analyst coverage in periods T-2 to T+2. A second regression analysis is also performed, with the IR rating as the dependent variable, as shown in equation 2 (b) below. Conversely, this tests for how existing levels of analyst coverage may affect the firms' IR ratings. Together the results of these two tests may show whether either analyst following appears to 'drive' the IR ratings or whether effective IR ratings 'drive' levels of analyst following i.e. whether analyst following either leads or lags effective IR).

6.3.4 Regression models

The regression models control for market value, following Botosan (1997):

$$AF_{iT} = y_0 + y_1 IR_i + y_2 MV_{iT} + \epsilon_{iT} \qquad (2a)$$

$$IR_i = y_0 + y_1 AF_{iT} + y_2 MV_{iT} + \epsilon_{iT} \qquad (2b)$$

where:

IR_i = IR rating of firm i nominated in the IR awards 2000 to 2002 (1999 to 2002 for UK firr

T = 2000 to 2002 for US firms and 1999 to 2002 for UK firms, as defined in section 6.1

AF_{iT} = number of analysts publishing forecasts in *Thomson Financial, I/B/E/S FirstCall* database for firm i in year T

MV_{iT} = market value of firm i at 31st March in year T

ϵ_{iT} = the error term in year T

y_0 = intercept term

y_1/ y_2 = regression coefficients for IR rating/market value terms

This concludes this section and the empirical results are described in chapter 7, section 7.2.

6.4 Methodology for testing the relationship between IR and equity trading volumes - null hypothesis *H03*

6.4.1 Introduction

The literature reviewed in section 3.3 shows that there is a positive relationship between stock liquidity and the volume of equity traded. Based on this, this section describes the methodology employed for testing the relationship between the firms' IR rating and stock liquidity, by measuring levels of, and changes in, firm' equity trading volumes.

6.4.2 Alternative methodologies for measuring liquidity

The main alternative to using trading volumes as a method of measuring liquidity is the bid-ask spread, where the size of the spread is negatively related to the degree of liquidity. I use equity trading volumes to measure liquidity, firstly because the existing research described in section 3.3 finds that trading volumes are directly inversely related to the size of the bid-ask spread and, secondly, because data on stock trading volumes are available for all of the UK and US firms in the research samples, whereas data on the bid-ask spread is only available for a sub-set of the firms, which would have restricted the test sample sizes.

6.4.3 The models

The models used to test the relationship between equity trading activity and the firm's IR rating follow Amihud, Mendelson and Lauterbach (1997).

6.4.3.1 Relative Equity Trading Volumes (RV)

This measures how a firm's monthly trading volumes have changed as a percentage of the trading volumes of the average firm in the same industry sector ('normal' volume). Industry sector volume is used to gauge 'normal' volume level because all firms in the same industry are expected to be subject to largely the same industry-specific factors that affect traded volumes.

Although there will be remaining firm-specific factors affecting trading volumes, including the market value of the firm, Amihud, Mendelson and Lauterbach (1997) argue that the effect of these on normal volume is mitigated to a large degree by averaging industry sector monthly volume by the number of firms in the sector at the

month end. However, in order to take account of any effect of firm size on trading volumes I perform an additional regression analysis, described below in section 6.4.3.5, which does control for firm' market value. RV is calculated as follows:

$$RV_{it} = V_{it} / (V_{mt}/N_{mt}) \quad (3)$$

where:

V_{it} = volume of equity of firm i traded during month t;

V_{mt} = volume of equity in firm i's industry sector traded during month t, and:

N_{mt} = the number of firms listed in firm i's industry sector in the FTSE All Share/S&P indices at the end of month t.

6.4.3.2 Change in relative volume (DRV)

I also compute the change in relative volume (DRV), which is a summary statistic for changes in the firms' stock liquidity, and present mean DRV for portfolios of firms, formed as described above in section 6.1. DRV is calculated as follows, with the variables defined as above:

$$DRV_{it} = V_{it} / (V_{mt}/N_{mt}) - V_{it-1} /(V_{mt-1} / N_{mt-1}) \quad (4)$$

Finally I compute the percentage of firms for which DRV is positive versus negative and then a significance test of the change in the firms' RV, which is a t test to test the significance of any change in the mean of the RV between periods T-1 and T for the set of firms nominated in each IR award. This t test essentially provides support for the significance of the percentages of DRV that are positive and negative.

6.4.3.3 Liquidity ratio (LR)

The liquidity of a stock can be defined as "*The ease with which the market can absorb volume buying or selling, without a dramatic fluctuation in price*" (Amihud, Mendelson and Lauterbach, 1997). Therefore an alternative and widely used measure of liquidity is to compares changes in volumes to changes in price (Cooper, Groth and Avera, 1985, Khan and Baker, 1993). This measure is called the liquidity ratio (LR), but is also sometimes referred to as the *Amivest Ratio* after an industry practitioner who popularised its use. The liquidity ratio is defined as:

$$LR_{it} = \sum_{T}^{T+1} V_{it} / \sum |R_{it}| \quad (5)$$

where:

V_{it} = the traded volume of stock of firm i during month t

R_{it} = the return on stock of firm i in month t

The summation (Σ) is performed over both the 12-month periods prior to and following the month of the award (T and T+1). LR measures the trading volume of a stock associated with a unit change in the stock price. A higher LR implies greater market 'depth' because it shows the 'price elasticity' of a stock to a change in its trading volumes or, alternatively, the 'volume elasticity' of a stock to a change in its price. This is potentially a very important ratio for a firm and for an IR manager to monitor, because if the LR ratio of a share increases, any factors affecting share price will then have a higher impact on the level of volumes traded and on liquidity.

6.4.3.4 Change in the liquidity ratio (DLR)

DLR provides a summary and more tractable measure to show how the change in equity trading over time may be associated with a change in stock returns over time. A DLR greater than 1 indicates an increase in 'market depth' i.e. that the stock's traded volume has become more price-elastic or volume-elastic over time and indicates an increasingly liquid market for the stock. DLR is calculated as follows:

$$DLR_i = LR_{iT+1} / LR_{iT} \quad (6)$$

T = the 12 months preceding the month of the IR award

Finally, I present the average DLR for the portfolios of firms, which are formed as described above in section 6.1, and also the percentage of firms for which DLR is greater to and less than I and a t test to test the significance of any change in the mean of the LR between periods T-1 and T for the set of firms nominated in each IR award. This t test essentially provides support for the significance of the percentages of DLR that are greater to and less than one.

6.4.3.5 Regression analysis

This analysis tests the relationship between equity trading volumes and the IR rating but controls for the potentially correlated variables of firm size (measured by market value at 31 March) and equity beta. This is because trading volumes of larger and less risky firms are likely to be higher than for smaller and more risky firms so the

omission of these factors might otherwise bias the results. The following regression equation is estimated for the samples of all nominated firms in each IR award, to test for any relationship between the firm IR rating and stock liquidity, controlling for size and risk, during periods prior to (periods T-2 to T) and subsequent to the IR award nominations (period T+1 and T+2).

$$Vol_{iT-2\ to\ T+2} = y_0 + y_1 IR_{it} + y_2 \log MV_{i\ T-2\ to\ T+2} + y_3 \beta_{iT-2\ to\ T+2} + \epsilon_{i\ T-2\ to\ T+2} \quad (7)$$

where:

y_0 = intercept term;

y_1, y_2 and y_3 = coefficients for the IR rating, market value and equity beta factors;

$Vol_{i\ T-2\ to\ T+2}$ = mean of monthly equity trading volumes for firm i in year T-2 to T+2;

IR_{iT} = IR rating of firm i in year T;

$MV_{iT-2\ to\ T+2}$ = natural log of the market value of firm i at 31st March in year T-2 to T+2;

$\beta_{i\ T-2\ to\ T+2}$ = equity beta of firm i in year T-2 to T+2;

$\epsilon_{i\ T-2\ to\ T+2}$ = error term T-2 to T+2

T = 2000 to 2002 for US firms and 1999 to 2002 for UK firms.

Data sources: Equity trading volumes are sourced from the *Thomson Financial DataStream* database. Industry sectors and index volumes are downloaded from the London Stock Exchange website (*http://www.londonstockexchange.com/)* and the New York Stock Exchange website *(http://www.nyse.com/)*.

6.5 Methodology for testing for a relationship between IR and ex-ante cost of equity capital – null hypothesis *H04*

6.5.1 Introduction

This section describes the method I use to estimate the expected cost of equity capital and the reasons for employing this model over alternative methodologies. The section also describes the tests performed to test the relationship between effective IR and the cost of capital.

6.5.2 The expected cost of equity capital

In this research ex-ante cost of equity capital is estimated by using a version of the Finite Horizon Gordon Dividend Growth Model (Gordon and Gordon, 1997). This is a measurement method that has been widely used in extant research (e.g. Botosan and Plumlee, 2002).

6.5.3 Benchmarking my cost of equity capital estimates

Ideally, in order to test the robustness of the cost of equity capital estimates that I calculate using the Finite Horizon Gordon Dividend Growth Model, a comparison would be made to an appropriate benchmark, such as an average cost of capital by industry, or by using some other 'normal' measure. However, the identification of an appropriate benchmark for this purpose is problematic, because estimates that have been made of the equity risk premium vary widely, depending upon the time period over which the estimate is calculated and the risk-free rate chosen.

Estimates of the equity risk premium in the literature range from 3% to 9% (Claus and Thomas, 1999). The most frequently cited estimates in the literature are those provided by Ibbotson Associates (Ibbotson Associates, 1999), a US company founded in 1977 by Professor Ibbotson, to provide products and services to investment professionals. Ibbotson Associates produces an annual review of historic rates of return observed dating back to 1926 for various portfolios of stocks and bonds and Ibbotson Associates estimate the over the past decade the equity risk premium has varied between 7% and 9%. However other researchers, notably Siegel (1992), suggest that ex-post estimates are highly sensitive to the particular period sampled. Siegel estimates the equity risk premium over three consecutive

periods from 1802 to 1870, 1871 to 1925 and 1926 to 1992, obtaining data on historic stock prices from three different sources; Cowles (1938), the Standard & Poor's database and lastly from Schwert (1990) and the resulting average estimates of the equity risk premium for these three periods are 0.6 %, 3.5% and 5.9%. Meanwhile, in his best-selling investment book, Siegel (2002) showed that, historically, the long-term annualised real return on US common stocks has been very stable and this stability in the equity risk premium has since been coined 'Siegel's constant' or 's'.

In another study, Claus and Thomas (1999) conclude that since 1985 the equity risk premium has averaged only 3%, Claus and Thomas (1999), calculated using the residual income valuation model and assuming a constant growth in abnormal earnings. Whilst the authors recognise that their estimate appears low there is no further analysis to test the robustness or their results.

More recently, Dimson, Marsh and Staunton (2004) calculate long-term real equity returns in 16 different countries, using data from 1900 to 2002. They estimate that real returns over this 103 year-period in the US were 6.3% and for other countries they ranged from 1.8% in Belgium to 7.4% in Australia. Dimson, Marsh and Staunton (2004) also combine the data across the 16 countries and estimate that, if this can be taken as a reflection of a 'global equity index', then global long-run real equity returns averaged close to 5.0% in real US dollar terms. They conclude that because their findings show a lower return to equity than suggested by much previous research, "*Common stocks cannot be regarded as safe in real terms even when the investor has a horizon of 20 years or more*".

Due to this apparent wide variation in consensus in the research over the historic level of equity returns over a particular time period, let alone within one country or industry sector, it is appears futile to use any specific benchmark measure to support viability of future levels in the cost of equity capital that I calculate in this thesis. In addition, because the purpose of this research is to test a *directional hypothesis and not to conclude that the estimates of the cost of capital are 'correct'*, it is considered sufficient for these purposes to use a robust and consistent method to calculate cost

of capital estimates that approximate the cross-sectional distribution of the risk premium.

6.5.4 Alternative methodologies

As described in chapter 3, there have been some attempts in the literature to assess the adequacy of different models for estimating the expected cost of equity capital by examining how well the estimates produced are associated with the historic cross-sectional distribution in risk factors associated with realised equity returns in a consistent and predictable manner. For reasons explained in chapter 3, the estimate used in this thesis is following the research in this vein by Botosan and Plumlee (2005) that I described in section 3.4.5 (i).

6.5.6 The finite-horizon Gordon dividend growth model

This is the model that I use to estimate the firm's cost of equity capital and is identical to the *rDIVPREM* model that Botosan and Plumlee (2005) recommend. It is essentially a model that derives the implicit discount rate from discounting estimated future stock cash flows. A stock's main cash flows are the purchase price, any interim dividend income and the future proceeds of sale (i.e. the future share price, ignoring transactions such as scrip issues). This model therefore derives the ex-ante internal rate of return implicit in equating the current share price to the discounted expected future dividends and future share price. Because the effectiveness of firms' IR is measured over discrete 12-months periods ending 31st March, the cost of equity capital of the firms is estimated by equating the actual share price at time t, which is 31st March in period T (as defined in section 6.1) to the sum of the discounted forecasted future dividends four periods into the future and the forecasted share price four period ahead. The model is set out below:

$$P_t = \sum_{\lambda=1}^{4} (1+ r_{iT})^{-\lambda} E_T(d_{iT}) + (1+r_{iT})^{-4} P_4 \qquad (8)$$

where:

The finite date is set at 4 because four years is the longest period ahead for which analysts publish stock price forecasts (see below).

P_t, P_4 = stock price on 31st March in year T and 4-year forecast stock price;

t = 31st March in period T and is 2000 to 2002 for the US firms and 1999 to 2002 for the UK firms, as defined in section 6.1;

r_{iT} = cost of equity capital estimate for firm i in period T;

d_{iT} = forecast dividends of firm i in period T;

E_T = the expectations operator.

This model is then run for periods T-2, T-1, T+1 and T+2 where t -2 is the stock price at 31st March in period T-2, t-1 is stock price at 31st March in period T-1 etc., resulting in an ex-ante cost of equity capital estimate for each firm for each year T-2 to T+2.

A conceptual problem with this model is in determining the market's expectations about future levels of dividends and prices. However, these can be very closely approximated from the consensus forecasts of security analysts, a research method that is established in the prior literature, e.g. Botosan and Plumlee (2002 and 2005). Analyst forecasts are used because their opinions are presumably derived from highly sophisticated and informed analysis and are likely to reflect consensus market expectations.

The forecasts used in this research are those published on the *Thomson Financial FirstCall and I/B/E/S* databases. My model employs a four-year forecast horizon because this is the longest horizon over which forecasts are published in these databases. These databases contain (amongst a wealth of other information) at least a 10-year history of actual equity price and dividend data and also quarterly 10-year history of the mean analyst dividend and stock price forecasts and respective forecast growth rates. Analysts do not publish share price and/or dividends forecasts for some of the firms in the samples for this research. Where this is the case, the average forecasted share price and dividend growth rates across the sample of firms in each IR award are applied to the current share price and most recent dividend and extrapolated four periods into the future. This is also an established solution that has been employed in past research to estimate forecast variables (e.g. Botosan and

Plumlee, 2002). This solution was only necessary in a small minority of these missing cases, in fact in less than 5% of each annual IR award sample and, by using either mean forecasts or by applying mean growth rate forecasts, forecasts were obtained for all firms.

6.5.7 Tests and Models

6.5.7.1 Descriptive statistics

For each period T-2 to T+2 descriptive statistics are presented for the estimated cost of equity capital for all UK and US IR award-nominated firms and are shown in chapter 7.

6.5.7.2 Portfolio formation

Secondly, I also test the average cost of capital estimate for the firms divided into portfolios of firms over the periods T-2 to T+2, to test for any relationship between the IR ratings and cost of capital in each period and also over the time periods both prior to and following the month of award nomination. The portfolios are formed as described in section 6.1.3.2.

6.5.7.3 Regression analyses

In addition, because the literature has shown that the cost of equity is negatively related to firm size and positively related to firm risk, and following the model employed by Botosan and Plumlee (2002), a further test is performed that controls for these factors. The relationship between IR rating and the average estimated cost of capital is tested for the pooled UK and US samples of firms in the periods T-2 to T+2, using regression analysis, controlling for the firm's market value and equity beta, following Botosan and Plumlee (2002):

$$r_{iT} = y_0 + y_1 IR_{iT} + y_2 \log (MV)_{iT} + y_3 \beta_{iT} + \varepsilon_{iT} \quad (9)$$

where:

y_0 = intercept term;

y_1, y_2, y_3 = coefficients for the IR ratings, market value and equity beta factors;

r_{iT} = estimated cost of equity capital for firm i in year T;

IR_{iT} = IR rating of firm i in year T;

$Log\ (MV)_{iT}$ = natural log of the market value of firm i at 31st March in year T;

β_{iT} = equity beta of firm i in year T (source: DataStream);

ε_{iT} = error term;

T = 2000 to 2002 (US firms), 1999 to 2002 (UK firms), as defined in section 6.1.

6.6 Summary of chapter

This concludes the chapter describing my empirical research methodologies, designed to test my hypotheses *H01* to *H06* developed in chapter 5 relating to the relationship between effective IR and firm equity returns, liquidity, cost of equity capital and analyst coverage. The following chapter reports the results of my analyses.

Chapter 7. Empirical Results

Introduction

In this chapter I present the results of the empirical tests and analyses described in chapter 6. The test results are discussed below in the following sections. Section 7.1 presents the results of the firms' equity returns, section 7.2 the test results relating to analyst coverage, section 7.3 the results for the firms' equity trading volumes and finally in section 7.4 I present the results for my tests of the cost of equity capital of the firms. In each of these sections I firstly describe the results relating to the variable tested and then how any significant findings address the relevant research hypothesis and the extent to which they can be explained by theory. The tables showing the results from testing the firm variable are set out at the end of each relevant section. Finally, in section 7.5, I summarise and conclude the chapter by discussing the extent to which my empirical results address the research questions posed in chapter 1.

7.1. Equity returns

In this section I describe the result of my empirical tests designed to address the following two null hypotheses:

H01: There is no significant relationship between effective IR and ***future excess equity returns.***

H05: There is no significant relationship between effective IR and ***prior excess equity returns.***

I describe my findings on any abnormal equity returns that the firms earn in the prior period T and the future period, T+1, firstly for the full set of all firms nominated for each IR award and then by dividing the firms in portfolios within award samples, which are formed as described in above section 6.1. Section 7.1.1 refers to the results for US firms and section 7.1.2 results for UK firms. I employ regression equation (1), described in section 6.2, controlling for firm size, book-to-market and momentum:

$$R_{P/it} - R_{Ft} = a + b\,(R_{Mt} - R_{Ft}) + s\,SMB_t + h\,HML_t + m\,MOM_t + \varepsilon_t \qquad (1)$$

In this equation, the intercept term, a, indicates the significance, sign and strength in two-tailed significance tests for any relationship between firms' IR rating and excess stock returns. Two-tailed tests are performed because my I set out to test for *any* abnormal prior or subsequent stock performance of the firms with ratings for effective IR. In section 7.1.3 I discuss how the results relate to hypotheses *H01* and *H05* and in section 7.1.4 how the results can be explained by theory. In section 7.1.5 I conclude and summarise my findings.

7.1.1. US firms' equity returns

7.1.1.1 Risk-adjusted returns across all nominated firms

The results of my tests for any abnormal prior and subsequent risk-adjusted equity returns of the US firms nominated for effective IR, are set out in table 7.1.1.1.and 7.1.1.2.

Period T

Table 7.1.1.1 shows that the larger firms did not earn significant abnormal equity returns in period T at normal significance levels, which is the 12-months immediately preceding their nomination in the IR award. However, the smaller firms earned significant excess equity returns of an average 1.2% per month (t = 2.602) at a 0.01 significance level and the sample combining the large and small firms earned significant excess returns of an average of 1.7% per month in period T (t = 2.246).

Period T+1

Table 7.1.1.2 shows that, across all nominated firms, none of the large or small firms with effective IR earned abnormal equity returns at a 0.05 level, in period T+1. Although the signs of the intercept coefficients are negative for all firm-size samples, indicating that the firms stocks earn inferior risk-adjusted returns in T+1, only the results for the small firms are weakly statistically significant at a 0.10 significance level (t = -1.874).

7.1.1.2 Portfolio risk-adjusted returns

The results of my tests for any abnormal prior and subsequent risk-adjusted returns of the US firms divided into portfolios are set out in table 7.1.1.3 to 7.1.1.8.

Period T

Table 7.1.1.3 shows that none of the portfolios of large firms earn significant risk-adjusted abnormal returns in period T (for a two-tailed 0.05 significance level). In contrast, table 7.1.1.4 shows that all three portfolios of small firms earn significant excess risk-adjusted returns in period T. Portfolio 1 of small firms on average earned excess returns of 1.9% per month (t = 3.380, 0.01 level of significance), which is almost 1% per month higher than firms in portfolio 2. Portfolio 2 earn significant excess returns of approximately 1% per month on average (t = 2.056) and the lowest IR rated group, portfolio 3, also earn over 1% per month on the same risk-adjusted basis (t = 2.001, both at 0.05 significance in two-tailed tests). Further, table 7.1.1.5 shows that the results are also significant in period T for the combined sample of smaller and larger firms divided into portfolios. Portfolio 1 of the combined sample on average earned excess returns of 1.3% per month (t = 2.781) at a 0.01 level, which is 0.3% per month higher than the average of firms in portfolio 2 and 3. Portfolio 2 and 3 show significant excess returns of 1% per month at a 0.05 level in two-tailed tests (t = 2.060 and t =2.031 respectively).

Period T+1

The results of the same test of the large, small and combined large and small firm portfolios, set out in tables 7.1.1.6 to 7.1.1.8, show that none of these portfolios of firms earned either significant inferior or significant excess risk-adjusted returns over period T+1. The regression coefficients for all firms of all size and for each portfolio are negative but although they are weakly negatively significant at a 0.01 level for portfolio 2 of small firms (t = -1.687 in table 7.1.1.7) they are not significant for portfolio 2 of the combined sample of large and small firms (in table 7.1.1.8).

This concludes my description of the empirical results relating to any relationship between effective IR and the stock returns of the US firms, which are further discussed below, together with the results for the UK firms, in section 7.1.3 and 7.1.4. The tables of test results for the US firms are set out on the following pages.

Table 7.1.1.1.
Results of regression analysis for all US firms nominated for Best Overall IR 2000 to 2002 during period T, the 12-month period immediately preceding 31 March of each IR award.

$R_t - R_{Ft} = a + b\,(R_{Mt} - R_{Ft}) + s\,SMB_t + h\,HML_t + m\,MOM_t + e_t$

where:

R_t = the average of the returns of all of the firms nominated in each award in month t,

R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,

RM_t = return on the S&P 500 in month t.

SMB_t = Return on the mimicking portfolio for the size factor in month t,

HML_t = Return on the mimicking portfolio for the B/M factor in month t,

MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;

a is the intercept coefficient and b, s, h and m the estimated coefficients for the Rm-Rf, SMB, HML, MOM factors and e is the error term.

Large Firms N =1,059

		Adj. R^2
		0.929
	Coeff.	**t**
a	0.050	1.476
s	0.027	4.013
h	0.014	2.727
m	-0.007	-1.647
b	0.948	20.424

Small Firms N = 2,054

		Adj. R^2
		0.892
	Coeff.	**t**
a	0.012	2.602
s	0.063	7.047
h	0.006	0.938
m	-0.012	-2.104
b	0.842	14.768

Large and Small Firms N = 3,113

		Adj. R^2
		0.918
	Coeff.	**t**
a	0.017	2.246
s	0.090	6.091
h	0.020	1.807
m	-0.018	-2.023
b	0.907	18.222

Table 7.1.1.2.
Results of regression analysis for all US firms nominated for Best Overall IR 2000 to 2002 during period T+1, the 12-month period immediately following 31 March in the year of each IR award.

$R_t - R_{Ft} = a + b\ (R_{Mt} - R_{Ft}) + s\ SMB_t + h\ HML_t + m\ MOM_t + e_t$
where:
R_t = the average of the returns of all of the firms nominated in each award in month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
RM_t = return on the S&P 500 in month t.
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;
a is the intercept coefficient and b, s, h and m the estimated coefficients for the Rm-Rf, SMB, HML, MOM factors and e is the error term.

Large Firms N = 1,059

		Adj. R^2
		0.917
	Coeff.	**t**
a	-0.020	-0.624
s	0.009	1.075
h	0.025	4.435
m	-0.007	-1.672
b	0.896	18.446

Small Firms N = 2,059

		Adj. R^2
		0.936
	Coeff.	**t**
a	-0.064	-1.874
s	0.020	3.169
h	0.020	3.828
m	-0.016	-4.323
b	0.961	21.281

Large and Small Firms N = 3,113

		Adj. R^2
		0.931
	Coeff.	**t**
a	-0.087	-1.271
s	0.033	2.159
h	0.046	4.293
m	-0.020	-3.056
b	0.949	20.529

Table 7.1.1.3.
Results of regression analysis for all large US firms nominated for Best Overall IR 2000 to 2002 by portfolio during period T, the 12-month period immediately preceding 31 March of each IR award.

Large Firms N = 1,059

$R_{Pt} - R_{Ft} = a + b\,(R_{Mt} - R_{Ft}) + s\,SMB_t + h\,HML_t + m\,MOM_t + e_t$
where:
R_{Pt} = the average of the returns of the companies in portfolio P during month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
R_{Mt} = Return on the S&P 500 in month t,
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t,
a is the intercept coefficient and b, s,h and m the estimated coefficients for the Rm-Rf, SMB, HML, MOM factors and e is the error term,
P = portfolio 1/2/3, where portfolio 1 contains the firms with the most award nominations.

Portfolio 1 N = 302

		Adj. R^2
		0.859
	Coeff.	**T**
a	0.080	1.628
s	0.010	1.370
h	0.010	1.332
m	-0.010	-1.334
b	0.992	14.067

Portfolio 2 N = 246

		Adj. R^2
		0.914
	Coeff.	**T**
a	0.010	0.928
s	0.020	3.140
h	0.010	1.920
m	0.000	-0.270
b	1.068	18.829

Portfolio 3 N = 511

		Adj. R^2
		0.904
	Coeff.	**T**
a	0.060	1.638
s	0.030	4.419
h	0.020	2.789
m	-0.010	-2.247
b	0.971	17.034

Table 7.1.1.4.
Results of regression analysis for all small US firms nominated for Best Overall IR 2000 to 2002 by portfolio during period T, the 12-month period immediately preceding 31 March of each IR award.

Small Firms N = 2,054

$R_{Pt} - R_{Ft} = a + b\ (R_{Mt} - R_{Ft}) + s\ SMB_t + h\ HML_t + m\ MOM_t + e_t$
where
:
R_{Pt} = the average of the returns of the companies in portfolio P during month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
R_{Mt} = Return on the S&P 500 in month t,
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;
a is the intercept coefficient and b, s,h and m the estimated coefficients for the Rm-Rf, SMB, HML, MOM factors and e is the error term,
P = portfolio 1/2/3, where portfolio 1 contains the firms with the most award nominations.

Portfolio 1 N = 385

		Adj. R^2
		0.839
	Coeff.	**t**
a	0.019	3.380
s	0.040	3.903
h	0.010	0.782
m	-0.010	-0.887
b	1.025	12.608

Portfolio 2 N = 389

		Adj. R^2
		0.915
	Coeff.	**t**
a	0.010	2.056
s	0.050	6.512
h	0.020	2.664
m	-0.010	-2.024
b	1.081	17.753

Portfolio 3 N = 1,280

		Adj. R^2
		0.859
	Coeff.	**t**
a	0.011	2.001
s	0.070	7.155
h	0.000	0.411
m	-0.010	-2.139
b	1.080	17.750

Table 7.1.1.5.
Results of regression analysis for all large and small US firms nominated for Best Overall IR 2000 to 2002 by portfolio during period T, the 12-month period immediately preceding 31 March of each IR award.

Large and Small Firms N = 3,113

$R_{Pt} - R_{Ft} = a + b\ (R_{Mt} - R_{Ft}) + s\ SMB_t + h\ HML_t + m\ MOM_t + e_t$
where:
R_{Pt} = the average of the returns of the companies in portfolio P during month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
R_{Mt} = Return on the S&P 500 in month t,
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;
a is the intercept coefficient and b, s,h and m the estimated coefficients for the Rm-Rf, SMB, HML, MOM factors and e is the error term,
P = portfolio 1/2/3, where portfolio 1 contains the firms with the most award nominations.

Portfolio 1 N = 687

		Adj. R^2
		0.882
	Coeff.	**t**
a	0.013	2.781
s	0.030	3.380
h	0.010	1.013
m	-0.010	-0.956
b	1.011	15.463

Portfolio 2 N = 635

		Adj. R^2
		0.926
	Coeff.	**t**
a	0.010	2.060
s	0.040	5.735
h	0.010	2.439
m	-0.010	-1.322
b	1.078	19.705

Portfolio 3 N = 1,791

		Adj. R^2
		0.881
	Coeff.	**t**
a	0.010	2.031
s	0.060	6.985
h	0.010	0.933
m	-0.010	-2.231
b	0.913	13.791

Table 7.1.1.6.
Results of regression analysis for all large US firms nominated for Best Overall IR 2000 to 2002 by portfolio during period T+1, the 12-month period immediately following 31 March in the year of each IR award.

Large Firms N = 1,059

$R_{Pt} - R_{Ft} = a + b\,(R_{Mt} - R_{Ft}) + s\,SMB_t + h\,HML_t + m\,MOM_t + e_t$

where:

R_{Pt} = the average of the returns of the companies in portfolio P during month t,

R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,

R_{Mt} = Return on the S&P 500 in month t,

SMB_t = Return on the mimicking portfolio for the size factor in month t,

HML_t = Return on the mimicking portfolio for the B/M factor in month t,

MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;

a is the intercept coefficient and b, s,h and m the estimated coefficients for the Rm-Rf, SMB, HML, MOM factors and e is the error term,

P = portfolio 1/2/3, where portfolio 1 contains the firms with the most award nominations.

Portfolio 1 N = 302

		Adj. R^2
		0.914
	Coeff.	**t**
a	-0.030	-0.682
s	0.000	0.459
h	0.020	3.047
m	0.000	-0.456
b	0.941	18.301

Portfolio 2 N = 246

		Adj. R^2
		0.861
	Coeff.	**t**
a	-0.050	-1.141
s	0.020	1.921
h	0.020	3.273
m	-0.010	-1.607
b	0.863	13.701

Portfolio 3 N = 511

		Adj. R^2
		0.880
	Coeff.	**t**
a	-0.020	-0.406
s	0.010	0.885
h	0.030	4.282
m	-0.010	-1.717
b	0.895	14.956

Table 7.1.1.7.
Results of regression analysis for all small US firms nominated for Best Overall IR 2000 to 2002 by portfolio during period T+1, the 12-month period immediately following 31 March in the year of each IR award.

Small Firms N = 2,054

$R_{Pt} - R_{Ft} = a + b\ (R_{Mt} - R_{Ft}) + s\ SMB_t + h\ HML_t + m\ MOM_t + e_t$
where:
R_{Pt} = the average of the returns of the companies in portfolio P during month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
R_{Mt} = Return on the S&P 500 in month t,
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;
a is the intercept coefficient and b, s,h and m the estimated coefficients for the Rm-Rf, SMB, HML, MOM factors and e is the error term.
P = portfolio 1/2/3, where portfolio 1 contains the firms with the most award nominations.

Portfolio 1 N = 385

		Adj. R^2
		0.900
	Coeff.	**T**
a	-0.060	-1.386
s	0.010	1.142
h	0.020	2.412
m	-0.020	-3.429
b	1.009	17.113

Portfolio 2 N = 389

		Adj. R^2
		0.914
	Coeff.	**t**
a	-0.070	-1.687
s	0.020	2.766
h	0.020	3.881
m	-0.010	-3.314
b	0.930	17.943

Portfolio 3 N = 1,280

		Adj. R^2
		0.563
	Coeff.	**t**
a	-0.011	-1.055
s	0.020	0.819
h	0.020	1.074
m	-0.030	-2.254
b	0.938	6.549

Table 7.1.1.8.
Results of regression analysis for all large and small US firms nominated for Best Overall IR 2000 to 2002 by portfolio during period T+1, the 12-month period immediately following 31 March in the year of each IR award.

Large and Small Firms N = 3,113

$R_{Pt} - R_{Ft} = a + b\ (R_{Mt} - R_{Ft}) + s\ SMB_t + h\ HML_t + m\ MOM_t + e_t$
where:
R_{Pt} = the average of the returns of the companies in portfolio P during month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
R_{Mt} = Return on the S&P 500 in month t,
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;
a is the intercept coefficient and b, s,h and m the estimated coefficients for the Rm-Rf, SMB, HML, MOM factors and e is the error term,
P = portfolio 1/2/3, where portfolio 1 contains the firms with the most award nominations.

Portfolio 1 N = 687

		Adj. R^2
		0.927
	Coeff.	**t**
a	-0.050	-1.424
s	0.010	1.139
h	0.020	2.881
m	-0.010	-2.900
b	0.975	20.356

Portfolio 2 N = 635

		Adj. R^2
		0.915
	Coeff.	**t**
a	-0.050	-1.256
s	0.030	3.528
h	0.020	4.092
m	-0.010	-2.332
b	0.913	17.836

Portfolio 3 N = 1,791

		Adj. R^2
		0.926
	Coeff.	**t**
a	-0.050	-1.382
s	0.020	2.612
h	0.020	4.052
m	-0.020	-3.966
b	0.933	19.668

7.1.2 UK firms' equity returns

7.1.2.1 Risk-adjusted returns across all nominated firms

The results of my tests for any abnormal prior and subsequent risk-adjusted equity returns of the UK firms nominated for effective IR, employing regression analysis, controlling for firm size, book-to-market and momentum are set out in table 7.1.2.1 and 7.1.2.2.

Period T

Table 7.1.2.1 shows that in period T only the firms nominated for *UK Best IR Communications of Information in the Annual Report* earned significant excess risk-adjusted returns at a 0.05 level of an average 2.9% per month (t = 2.162). Although the signs on the intercept coefficients are also positive for the firms nominated for *Best IR Officer* and *Best Results Meetings*, they are not statistically significant (t = 1.253 and t = 1.293 respectively).

Period T+1

However, table 7.1.2.2 shows no significant results to indicate that the firms nominated for any of the three UK IR awards earned either significant excess or significant inferior risk-adjusted equity returns in period T+1.

7.1.2.2 Portfolio risk-adjusted returns

The results of my tests for any abnormal prior and subsequent risk-adjusted returns of the UK firms, divided into portfolios as described in section 6.1, are set out in tables 7.1.2.3 to 7.1.2.8.

Period T

Tables 7.1.2.3 to 7.1.2.5 show that the only results that are significant in period T, at a 0.05 two-tailed significance level, across all three of the UK IR awards are for the firms with the most nominations in portfolio 1. Meanwhile, the firms with fewer nominations, in portfolios 2 and 3, do not have significant equity returns in period T.

Portfolio 1 of UK firms nominated for the *Best IR Officer* category award earned excess returns of on average 1.7% per month (t = 2.020), 0.3% per month higher that the firms in portfolio 2 and 0.5% per month more than the firms in portfolio 3 (table 7.1.2.3). Firms nominated for *Best Results Meetings with Analysts and Fund*

Managers earned average excess returns of 2% per month, t = 2.045, 0.8% per month more than portfolio 2 and 0.6% per month more than portfolio 3 (table 7.1.2.4). Similarly, the firms in the *Best IR Communications in the Annual Report* portfolio 1 earn excess share returns of 3.9% per month in period T (t = 2.059), as shown in table 7.1.2.5.

Period T+1

Finally, tables 7.1.2.6 to 7.1.2.8 show that in period T+1 the same portfolios of firms do not earn significant equity returns, regardless of the category of IR in which they were nominated and of the number of nominations they receive.

The tables of results for my tests of a relationship between effective IR and stock returns for the UK firms are set out on the following pages, and I further discuss all my results below in section 7.1.3 and 7.1.4.

Table 7.1.2.1.
Results of regression analysis for all UK firms nominated 1999 to 2002 during period T, the 12-month period immediately preceding 31 March in the year of each IR award.

$R_t - R_{Ft} = a + b\,(R_{Mt} - R_{Ft}) + s\,SMB_t + h\,HML_t + m\,MOM_t + e_t$
where:
R_{Pt} = the average of the returns of all of the firms nominated in each award in month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
R_{Mt} = Return on the FTSE All Share in month t,
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;
a is the intercept and b, s, h and m are the estimated coefficients on the Rm-Rf, SMB, HML, MOM factors and e is the error term.

Best IR Officer Award N = 461

		Adj. R^2
		0.304
	Coeff.	**t**
a	0.019	1.253
s	0.235	3.543
h	0.140	1.698
m	-0.386	-1.433
b	1.184	10.805

Best Results Meeting N = 412

		Adj. R^2
		0.322
	Coeff.	**t**
a	0.020	1.293
s	0.272	3.957
h	0.136	1.593
m	-0.350	-1.255
b	1.015	10.622

Best Annual Report N = 381

		Adj. R^2
		0.312
	Coeff.	**T**
a	0.029	2.162
s	0.217	3.719
h	0.149	2.058
m	-0.309	-1.309
b	1.063	10.313

Table 7.1.2.2.
Results of regression analysis for all UK firms nominated 1999 to 2002 during period T+1, the 12-month period immediately following 31 March in the year of each IR award.

$R_t - R_{Ft} = a + b\ (R_{Mt} - R_{Ft}) + s\ SMB_t + h\ HML_t + m\ MOM_t + e_t$
where:
R_{Pt} = the average of the returns of all of the firms nominated in each award in month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
R_{Mt} = Return on the FTSE All Sharel in month t,
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;
a is the intercept and b, s, h and m are the estimated coefficients on the Rm-Rf, SMB, HML, MOM factors and e is the error term.

Best IR Officer Award N = 461

		Adj. R^2
		0.427
	Coeff.	**t**
a	-0.030	-0.176
s	0.310	4.035
h	0.862	0.994
m	-0.389	-2.734
b	1.258	10.039

Best Results Meeting N = 412

		Adj. R^2
		0.452
	Coeff.	**t**
a	0.000	0.016
s	0.308	4.104
h	0.105	1.239
m	-0.423	-3.044
b	1.244	10.008

Best Annual Report N = 381

		Adj. R^2
		0.421
	Coeff.	**t**
a	0.040	0.232
s	0.269	3.884
h	0.856	1.098
m	-0.405	-3.162
b	1.138	10.620

Table 7.1.2.3.
Results of regression analysis for all UK firms nominated for Best IR Officer 1999 to 2002 by portfolio during period T, the 12-month period immediately preceding 31 March in the year of each IR award.

Best IR Officer Award

$R_{Pt} - R_{Ft} = a + b\,(R_{Mt} - R_{Ft}) + s\,SMB_t + h\,HML_t + m\,MOM_t + e_t$
where:
R_{Pt} = the average of the returns of the companies in portfolio P during month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
R_{Mt} = Return on the FTSE All Share in month t,
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;
a is the intercept and b, s, h and m are the estimated coefficients on the Rm-Rf, SMB, HML, MOM factors and e is the error term,
P = portfolio 1/2/3, where portfolio 1 contains the firms with the most award nominations.

Portfolio 1 N = 153

		Adj. R^2
		0.296
	Coeff.	**t**
a	0.017	2.020
s	0.115	3.082
h	0.140	3.006
m	-0.217	-1.426
b	1.050	10.387

Portfolio 2 N = 147

		Adj. R^2
		0.304
	Coeff.	**T**
a	0.014	1.490
s	0.134	3.172
h	0.135	2.592
m	-0.316	-1.852
b	1.014	10.095

Portfolio 3 N = 161

		Adj. R^2
		0.255
	Coeff.	**t**
a	0.012	1.082
s	0.171	3.588
h	0.853	1.442
m	-0.247	-1.275
b	1.024	10.143

Table 7.1.2.4.
Results of regression analysis for all UK firms nominated for Best Results Meetings 1999 to 2002 by portfolio during period T, the 12-month period immediately preceding 31 March in the year of each IR award.

Best Results Meeting Award

$R_{Pt} - R_{Ft} = a + b\ (R_{Mt} - R_{Ft}) + s\ SMB_t + h\ HML_t + m\ MOM_t + e_t$

where:

R_{Pt} = the average of the returns of the companies in portfolio P during month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
R_{Mt} = Return on the FTSE All Share in month t,
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;
a is the intercept and b, s, h and m are the estimated coefficients on the Rm-Rf, SMB, HML, MOM factors and e is the error term,
P = portfolio 1/2/3, where portfolio 1 contains the firms with the most award nominations.

Portfolio 1 N = 136

		Adj. R^2
		0.255
	Coeff.	**t**
a	0.020	2.045
s	0.125	2.940
h	0.129	2.444
m	-0.349	-2.024
b	1.078	10.532

Portfolio 2 N = 133

		Adj. R^2
		0.312
	Coeff.	**T**
a	0.012	1.242
s	0.145	3.373
h	0.153	2.880
m	-0.166	-0.955
b	1.024	10.161

Portfolio 3 N = 143

		Adj. R^2
		0.321
	Coeff.	**t**
a	0.014	1.386
s	0.192	4.354
h	0.806	1.481
m	-0.148	-0.830
b	1.005	10.036

Table 7.1.2.5.
Results of regression analysis for all UK firms nominated for Best Annual Report 1999 to 2002 by portfolio during period T, the 12-month period immediatel preceding 31 March in the year of each IR award.

Best Annual Report Award

$R_{Pt} - R_{Ft} = a + b\ (R_{Mt} - R_{Ft}) + s\ SMB_t + h\ HML_t + m\ MOM_t + e_t$

where:

R_{Pt} = the average of the returns of the companies in portfolio P during month t,

R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,

R_{Mt} = Return on the FTSE All Share in month t,

SMB_t = Return on the mimicking portfolio for the size factor in month t,

HML_t = Return on the mimicking portfolio for the B/M factor in month t,

MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;

a is the intercept and b, s, h and m are the estimated coefficients on the Rm-Rf, SMB, HML, MOM factors and e is the error term,

P = portfolio 1/2/3, where portfolio 1 contains the firms with the most award nominations.

Portfolio 1 N = 126

		Adj. R^2
		0.271
	Coeff.	**t**
a	0.039	2.059
s	0.139	3.426
h	0.105	2.100
m	-0.179	-1.088
b	1.006	10.043

Portfolio 2 N = 121

		Adj. R^2
		0.264
	Coeff.	**t**
a	0.019	1.894
s	0.912	2.096
h	0.171	3.177
m	-0.387	-2.191
b	1.044	10.291

Portfolio 3 N = 134

		Adj. R^2
		0.315
	Coeff.	**t**
a	0.012	1.374
s	0.162	4.074
h	0.113	2.288
m	-0.111	-0.687
b	1.091	10.663

Table 7.1.2.6.
Results of regression analysis for all UK firms nominated for Best IR Officer 1999 to 2002 by portfolio during period T+1, the 12-month period immediately following 31 March in the year of each IR award.

Best IR Officer Award

$R_{Pt} - R_{Ft} = a + b\ (R_{Mt} - R_{Ft}) + s\ SMB_t + h\ HML_t + m\ MOM_t + e_t$

where:
R_{Pt} = the average of the returns of the companies in portfolio P during month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
R_{Mt} = Return on the FTSE All Share in month t,
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;
a is the intercept and b, s, h and m are the estimated coefficients on the Rm-Rf, SMB, HML, MOM factors and e is the error term,
P = portfolio 1/2/3, where portfolio 1 contains the firms with the most award nominations.

Portfolio 1 N = 153

		Adj. R^2
		0.376
	Coeff.	**t**
a	-0.020	-0.142
s	0.178	3.914
h	0.417	0.814
m	-0.261	-3.109
b	1.033	10.226

Portfolio 2 N = 147

		Adj. R^2
		0.409
	Coeff.	**t**
a	-0.030	-0.242
s	0.239	4.843
h	0.556	1.000
m	-0.230	-2.524
b	1.067	10.423

Portfolio 3 N = 161

		Adj. R^2
		0.357
	Coeff.	**t**
a	0.030	0.243
s	0.166	3.520
h	0.117	2.202
m	-0.264	-3.023
b	1.031	10.203

Table 7.1.2.7.
Results of regression analysis for all UK firms nominated for Best Results Meetings 1999 to 2002 by portfolio during period T+1, the 12-month period immediately following 31 March in the year of each IR award.

Best Results Meeting Award

$R_{Pt} - R_{Ft} = a + b\ (R_{Mt} - R_{Ft}) + s\ SMB_t + h\ HML_t + m\ MOM_t + e_t$

Where:

R_{Pt} = the average of the returns of the companies in portfolio P during month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
R_{Mt} = Return on the FTSE All Share in month t,
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;
a is the intercept and b, s, h and m are the estimated coefficients on the Rm-Rf, SMB, HML, MOM factors and e is the error term,
P = portfolio 1/2/3, where portfolio 1 contains the firms with the most award nominations.

Portfolio 1 N = 136

		Adj. R^2
		0.305
	Coeff.	**t**
a	0.020	0.218
s	0.153	3.159
h	0.263	0.483
m	-0.280	-3.138
b	1.082	10.524

Portfolio 2 N = 133

		Adj. R^2
		0.357
	Coeff.	**t**
a	0.080	0.758
s	0.176	3.884
h	0.555	1.086
m	-0.223	-2.663
b	1.012	10.081

Portfolio 3 N = 143

		Adj. R^2
		0.415
	Coeff.	**t**
a	-0.080	-0.753
s	0.215	4.512
h	0.127	2.372
m	-0.220	-2.497
b	1.012	10.076

Table 7.1.2.8.
Results of regression analysis for all UK firms nominated for Best Annual Report 1999 to 2002 by portfolio during period T+1, the 12-month period immediately following 31 March in the year of each IR award.

Best Annual Report Award

$R_{Pt} - R_{Ft} = a + b\,(R_{Mt} - R_{Ft}) + s\,SMB_t + h\,HML_t + m\,MOM_t + e_t$

Where:

R_{Pt} = the average of the returns of the companies in portfolio P during month t,
R_{Ft} = the risk free rate (1 month UK treasury bill/US long bond rate) at the start of month t,
R_{Mt} = Return on the FTSE All Share in month t,
SMB_t = Return on the mimicking portfolio for the size factor in month t,
HML_t = Return on the mimicking portfolio for the B/M factor in month t,
MOM_t = Return on the mimicking portfolio for the momentum factor in month t, and;
a is the intercept and b, s, h and m are the estimated coefficients on the Rm-Rf, SMB, HML, MOM factors and e is the error term,
P = portfolio 1/2/3, where portfolio 1 contains the firms with the most award nominations.

Portfolio 1 N = 126

		Adj. R^2
		0.276
	Coeff.	**t**
a	-0.010	-0.070
s	0.158	3.556
h	0.605	1.205
m	-0.192	-2.332
b	1.078	10.544

Portfolio 2 N = 121

		Adj. R^2
		0.357
	Coeff.	**t**
a	0.070	0.587
s	0.184	3.571
h	0.530	0.915
m	-0.341	-3.588
b	1.161	10.972

Portfolio 3 N = 134

		Adj. R^2
		0.377
	Coeff.	**t**
a	0.050	0.558
s	0.162	3.966
h	0.793	1.726
m	-0.229	-3.033
b	1.042	10.322

7.1.3 Addressing the research hypotheses on equity returns

The *smaller sized* US firms nominated for having the *Best Overall IR* (2,054 firms) earned significant excess risk-adjusted returns of 1.2% per month on average in period T (the 12-months immediately before being nominated in the IR awards).

In addition, although each portfolio of US small firms individually earned excess returns in this period, the most highly-rated portfolio (385 firms) earned the highest returns, at an average 1.9% per month, although both portfolio 2 and 3 firms (389 firms and 1,280 firms) earned on average over 1% excess returns per month. In contrast, there is no evidence that even the most highly rated of the *larger sized* firms (1,059 firms) also nominated for having the *Best Overall IR* have significant excess equity returns over the 12-months immediately preceding the IR award nominations.

The results for the UK firms show that the full sample of 381 firms nominated for B*est UK Annual Report* have significant excess equity returns in the preceding period of an average 2.9% per month. Furthermore, the results by portfolio indicate that the *degree of IR effectiveness* (number of nominations) in this category of IR award matters, because only the sub-set of the firms in portfolio 1 (126 firms) have significant prior equity returns of an average 3.9% excess returns per month, whereas the results for portfolios 2 and 3 in the B*est Annual Report IR Communications* category are statistically insignificant.

There are no significant equity returns across the full sample of firms nominated for *Best UK IR Officer* (461 firms) or *Best UK Results Meetings with Fund Managers and Analysts* (412 firms) during the period immediately preceding the award nominations. However, the *most highly rated* sub-set of firms in both of these categories of IR (portfolio 1) *did* have excess returns, at on average 1.7% excess returns per month and 2.0% per month, respectively. Nonetheless, as with the firms in the UK *Best Annual Report IR Communications* category, results are also insignificant for portfolios 2 and 3 in these two IR award categories.

7.1.4 Theory

Finding that smaller US firms and UK firms earn significant prior excess returns is consistent with some of the predictions made by behavioural finance. Behavioural finance suggests that the bias of *representativeness* explains why high prior stock price performance can cause individuals to assign a cognitive 'financial halo' over firms, whereby their high past equity performance may come to *represent* to the respondents of the IR award survey that the firm is a 'good' firm, which has a 'good' IR policy. The implication is that prior financial performance causes them to express a preference towards these firms over others, in a seemingly irrational manner. An alternative, yet consistent, explanation for these findings, also provided by behavioural finance theory, is that these firms' enhanced IR policy increases their '*availability*' to security analysts and investors, and this also may have resulted in them being nominated in the IR awards.

As described above in section 7.1, US larger sized firms do not have significant prior excess returns. That they are nevertheless nominated for having the most effective overall IR may also be rooted in certain behaviours, described in behavioural finance, both of managers of the firms and the respondents to the IR award survey. Firstly, this is because the investment portfolios of the fund managers nominating firms for the IR awards are likely to comprise a high percentage of shares of larger firms. Therefore the stock performance of larger firms is probably already more *available* in the minds of these fund managers compared to that of smaller, and perhaps newer, firms that they do not research so actively, which is also consistent with the operation of the bias of *availability*.

In addition, as shown in the findings of existing empirical research described in section 3.2., large firms are also more likely to already have a larger body of security analysts following their performance compared to smaller-sized firms. Therefore larger firms may also have higher '*availability*' in the minds of analysts caused by their higher familiarity with them. Higher *availability* may cause analysts to be

positively biased towards these large firms and influence them to nominate a larger and more familiar firm for the IR award. Behavioural finance also suggests that some characteristics about a firm that are perceived as superior, such as large firm-size and having a long established history that brings an existing high level of market exposure for example, may be mentally transferred to *represent* characteristics of other firm' attributes, the form of a mental 'halo'. In this case, large firm size may come to *represent* a higher *standard of communication performance* in the eyes of the market i.e. larger firms are *expected to* provide better information than smaller firms, regardless of whether their shares are performing well or poorly.

It should be noted that my analysis in equation (1) described in section 6.2.3 specifically controls for any effect that firm size may have on the relationship between effective IR and excess equity returns, by including a SMB factor, defined in section 6.2.3 equation (i). That my findings for the smaller sized US firms (under $3bn market capitalisation in the year of the IR award) differ from those of the larger firms (over $3bn), suggests either that my methodology inadequately controls for firms size, or that my results pertain and in fact indicate a fundamental difference in the relationship between effective IR and stock returns for smaller versus larger firms.

Meanwhile although, as explained in section 4.1, information risk and agency theories predict that effective IR will be associated with a subsequent rise in stock prices, I do not find any empirical evidence of excess risk-adjusted equity returns for the US or UK firms. Therefore, my findings are contrary to those expected according to theory, but, as I describe in section 4.2.4, my findings are consistent with prior research, which also finds that firms nominated in surveys such as the *IR Magazine* IR award survey do not earn excess returns in subsequent periods.

7.1.5 Conclusion on equity returns

In conclusion, because the test results show that the firms do not earn significant future excess equity returns, there is no evidence to reject the following null hypothesis: ***H01:* that *there is no significant relationship between effective IR***

and future excess equity returns. Conversely, the findings of significant prior excess equity returns of smaller-sized US firms and of UK firms mean that the following null hypothesis is rejected, ***H05: there is no evidence of a significant relationship between effective IR and prior excess equity returns.*** However, because US larger sized firms do not earn significant excess prior returns, there is insufficient evidence to reject the null hypothesis ***H05: there is no significant relationship between effective IR and prior excess equity returns*** for larger sized firms, for the reasons suggested above.

This concludes the section describing the results of my empirical tests of equity returns. All of my findings on the relationship between effective IR and equity returns are discussed further in chapter 8.

7.2. Analyst Coverage

Introduction

Here I describe the results of testing the levels of analyst coverage of the firms with effective IR in periods both prior and subsequent to their nomination in the IR awards, in accordance with the two further null hypotheses that I developed in chapter 5:

H02: There is no significant relationship between effective IR and ***future increased levels of analyst coverage.***

H06: There is no significant relationship between effective IR and ***prior high levels of analyst coverage.***

My empirical analyses are designed to test, firstly, whether analyst coverage of firms with effective IR is higher in periods following the firms' nominations in the IR awards, compared to during periods prior to the IR awards. I do this by comparing the average number of analysts following each firm at the close of each year-end falling in the IR award years T-2, T-1, T, T+1 and T+2, as defined in section 6.1.

Secondly, I test for the existence and strength of any relationship between the number of nominations the firms receive and their level of analyst coverage in these

prior and subsequent periods. I do this, firstly, by dividing the firms into portfolios, which are formed as described in section 6.1.3.2, and comparing the average number of analysts per firm for portfolios of firms with the most IR award nominations (portfolio 1), to the average number of analysts for firms in portfolios containing firms with fewer nominations. In addition, I perform regression analysis, described in section 6.3.4, to test for any relationship between the firms' number of nominations and their analyst coverage (employing equations 2 (a) and 2(b) described in section 6.3.4) at the end of the year of the IR award, controlling for firm size. Because the regression analysis is performed over all periods T-2, T-1, T, T+1 and T+2, these test results may also show whether there is any relationship, and the strength of any relationship, in periods prior to the IR awards compared to subsequent periods.

Section 7.2.1 relates to the results of these tests for US firms and section 7.2.2 relates to the results for UK firms. The tables showing the relevant test results are set out at the end of each of these sections. In section 7.2.3 I discuss all of my findings in relation to hypotheses *H02* and *H06*, in section 7.2.4 I review how these findings relate to theory, and in section 7.2.5. I conclude on my findings on any relationship between prior and subsequent analyst coverage for the firms with effective IR.

Comparative analysis of my findings

Firstly, I show in appendix 4 a summary of my findings on the numbers of analysts covering the firms with effective IR compared to levels of analyst coverage found in the key relevant existing literature. This shows that across the pooled samples, in the year that the firms are nominated for the IR awards, the combined sample of large and small US firms 2000-2002 have an average level of coverage of 9.7 analysts per firm and that the average across all the UK firms 1999-2002 is 7.7 analysts per firm.

The average number of analysts covering all the firms in my research data set are low compared to those shown from comparative research; Lang and Lundholm

(1996) find an average of 17.6 analysts per firm for 751 US firms rated in the AIMR survey 1985-1989, and Botosan (1997) finds an average of 11.5 per firm for 122 US firms in 1991. However, Lang and Lundholm (1996) do not distinguish analyst following levels for differently sized firms and Botosan(1997) reports an average of only 4.8 analysts per firm for her 62 firms with "*low analyst coverage*", which is defined as below the median number of analysts in her full sample of 122 firms. My results for 'large firms' (over $3bn market capitalisation at the year end of the IR award) of an average of 16.3 analysts per firm and for the 'small firms' (under $3bn) of 3.9 per firm appear reasonable in this light.

7.2.1. US firms' analyst coverage

The results showing levels of analyst coverage of the US firms are shown below, in tables 7.2.1.1 to 7.2.1.3, following a discussion of my findings.

7.2.1.1 US large firms

Average number of analysts

Table 7.2.1.1 shows that the average number of analysts following large firms with effective IR is 15.3 per firm in period T-2, 16.3 per firm in period T-1, 16.3 per firm in the year leading up to the IR award nominations (period T), and falls to 12.3 and 11.3 analysts per firm in periods T+1 and T+2. This shows that, on the basis of simple averages, the firms have higher analyst following before, compared to after, the IR awards. The regression analysis described below in section 7.2.1.4 further tests this relationship whilst additionally controlling for firm size.

Meanwhile, my analysis of average coverage by portfolios of firms, shown in the second panel of table 7.2.1.1, also shows the marked relationship between the firms' number of IR award nominations and both their prior and subsequent levels of average analyst coverage. The US large firms in the portfolios with the most nominations (portfolio 1) attract higher average levels of analyst coverage than the firms in the portfolios with fewer nominations. The constituent firms in portfolio 1 (of 3), containing 302 out of 1,059 firms, are on average followed by 20.8 analysts in periods immediately preceding the awards, T-1 and T, and this is also the highest

coverage for this group of firms in any of the periods. Meanwhile, the maximum number of analysts for portfolios 2 and 3 (of 3) of large firms is 14.7 across any of the prior periods T-2, T-1 and T. The 105 firms in portfolio 1 (of 10) are followed by an average of 23.6 analysts in T-1 and T but attract slightly lower coverage in periods T-2 (22.6), T+1 (19.6) and T+2 (18.6). Finally, the correlation coefficients between number of nominations and analyst coverage whilst only showing a coefficient of marginally above 0.5 in each period across all the 1,059 firms, does show the relatively constant level of coverage of the firms over these five years, which indicates that analysts appear to have a high degree of inertia in switching their attention from firms that they follow. Overall, these results indicate a strong positive relationship between the perceived IR performance and prior and subsequent analyst coverage, but that the firms' coverage is generally higher prior to the IR awards.

7.2.1.2 US small Firms

Average number of analysts

Table 7.2.1.2 shows that the average number of analysts following each of the 2,054 small firms in period T-2 is 3.5, in periods T-1 is 3.7, in period T 3.9 and this average falls to 2.5 and 2.4 in period T+1 and T+2, showing that average analyst following for the small firms is lower than for large firms but is also higher in periods prior to the IR awards compared to during subsequent periods.

The second panel in table 7.2.1.2 shows the average coverage of the firms when divided into 3 portfolios. This shows that, in all periods T-2 to T+2, the small firms in portfolio 1 of 3, (385 out of 2054), attract the higher levels of analyst coverage compared to the firms in portfolios 2 and 3. The highest levels of coverage for these 385 firms are in periods T-1 and T, with an average of 7.0 and 6.8 analysts per firm. This is almost twice the average level attracted by the firms in portfolio 2 in these periods; 3.6 and 4.0 analysts per firm and the average for portfolio 3 is only 0.4 and 1.0 in T-1 and T. These findings indicate both that prior analyst coverage is higher than subsequent analyst coverage and also shows the positive relationship between the number of analysts following a firm and their number of IR awards nominations.

When divided into 10 portfolios, also shown in table 7.2.1.2, it is clearer that the highest levels of analyst coverage of the smaller-sized firms are concentrated on a small percentage of the firms with the most nominations. In all periods, the firms in portfolios 1,2,3 and 4 (totalling 821 firms out of 2,054) attract the majority of total analyst coverage across all the nominated smaller firms, leaving the other 1,233 small firms with almost no coverage during the periods I test. This skewed distribution of analyst coverage is shown more clearly in the table comparing the top 5 portfolios are compared to the bottom 5 portfolios, in the bottom panel of table 7.2.1.2. Approximately 50% of the firms that are in the 5 lowest portfolios have on average a maximum of less than 1 analyst each. Despite this, the correlation coefficients show a consistently strong relationship (over 0.8 in each period) between the firms' number of nominations and analyst coverage in all periods T-2 to T+2. These findings are discussed further in sections 7.2.3 to 7.2.5.

7.2.1.3 US large and small firms

Average number of analysts

Table 7.2.1.3 shows that across the combined sample of 3,113 large and small US firms an average of 9.0 analysts cover each firm in period T-2, 9.5 in T-1, 9.7 in T and 7.0 and 6.5 per firm in T+1 and T+2. This reflects my findings for the separate samples of large and small firms described above, that analyst coverage is higher for the firms in periods prior to the IR awards, compared to subsequently.

Table 7.2.1.3 also shows that the combined sample of large and small firms with the highest number of nominations, when grouped into both 3 and 10 portfolios, attract higher analyst coverage in all periods compared to the firms with fewer nominations. The 687 firms (of 3,113) in portfolio 1 (of 3) have their highest average analyst following in period T-1 and T of 16.7 analysts per firm (the 2 years immediately preceding the IR award nomination month), with only 15.7 analysts per firm in T-2, and analyst following falls to 12.7 and 11.7 for portfolio 1 in T+1 and T+2. Firms in portfolio 2 have the second highest analyst following in each of these periods (9.5, 10.5, 10.4, 7.7 and 7.1 in the respective consecutive periods) and firms in portfolio 3 have the lowest coverage in each period with only a maximum of 2.0 per firm in

period T. The bottom panel of table 7.2.1.3 compares average analyst coverage of the top 5 portfolios and the bottom 5. This shows the 1,555 firms receiving IR award nominations in the top 50% percentile rank have significantly higher average analyst coverage compared to the bottom 50%. The correlation coefficients of over 0.8 in each period further indicate the strong positive relationship between perceived effective IR and analyst coverage.

Overall, these results indicate both that for firms of all sizes there is a striking and almost monotonic positive relationship between analyst coverage and effective IR (measured by the firms' number of IR award nominations at least) and that analyst coverage is higher prior to the firms' nominations compared to in periods following the IR awards. These findings are discussed further in section 7.2.3 to 7.2.5 below.

This concludes the section describing the results of my analyses of average coverage levels. Tables 7.2.1.1 to 7.2.1.3 are set out on the following pages, followed by a description of the results of the regression analysis to test for any relationship between effective IR and prior and subsequent analyst coverage, controlling for firm size.

Table 7.2.1.1.
Results for large US Firms nominated for Best Overall IR 2000 to 2002 average number of analysts by portfolio

This table shows the average number of analysts following the US companies nominated in the Best IR Awards in 2000 to 2002. The 3 pooled portfolios are the firms nominated in the IR award in 2000, 2001 and 2002 divided into three portfolios 1,2 and 3, based on the ranked percentile of their number of IR award nominations (100% to 66.7%, 66.6% to 33.4%, 33.3% to 0.001%) and then pooled across these years. The 10 portfolios are formed by ranking the firms on their number of IR award nominations and dividing the total number of firms into 10 groups containing equal numbers of firms. The correlation coefficient measures the strength of the relationship between the firms' number of nominations and their analyst following. Analyst following numbers are taken from the average number of estimates at the year end in which the firm is nominated for an IR award shown in the Thomson Financial *FirstCall I/B/E/S* database.

Large Firms N = 1,059

Mean Annual Analyst Following

	T-2	T-1	T	T+1	T+2	N
Average	**15.3**	**16.3**	**16.3**	**12.3**	**11.3**	**1,059**
Portfolio						
1	19.8	20.8	20.8	16.8	15.8	**302**
2	13.7	14.7	14.7	10.7	9.7	**246**
3	12.4	13.4	13.4	9.4	8.4	**511**
Average	**15.3**	**16.3**	**16.3**	**12.3**	**11.3**	

Portfolio	**T-2**	**T-1**	**T**	**T+1**	**T+2**	**N**
1	22.6	23.6	23.6	19.6	18.6	**105**
2	21.1	22.1	22.1	18.1	17.1	**106**
3	15.3	16.3	16.3	12.3	11.3	**106**
4	13.4	14.4	14.4	10.4	9.4	**106**
5	13.5	14.5	14.5	10.5	9.5	**106**
6	13.5	14.5	14.5	10.5	9.5	**106**
7	12.0	13.0	13.0	9.0	8.0	**106**
8	12.0	13.0	13.0	9.0	8.0	**106**
9	12.1	13.1	13.1	9.1	8.1	**106**
10	12.9	13.9	13.9	9.9	8.9	**106**
Average	**15.3**	**16.3**	**16.3**	**12.3**	**11.3**	
Correlation Coefficient	0.531	0.531	0.531	0.532	0.532	

Portfolio	**T-2**	**T-1**	**T**	**T+1**	**T+2**	**N**
1-5	17.2	18.2	18.2	14.2	13.2	**529**
6-10	12.5	13.5	13.5	9.5	8.5	**530**
Total						**1,059**

Table 7.2.1.2.
Results for small US firms nominated for Best Overall IR 2000 to 2002 average number of analysts by portfolio

This table shows the average number of analysts following the US companies nominated in the Best IR Awards in 2000 to 2002. The 3 pooled portfolios are the firms nominated in the IR award in 2000, 2001 and 2002 divided into three portfolios 1,2 and 3, based on the ranked percentile of their number of IR award nominations (100% to 66.7%, 66.6% to 33.4%, 33.3% to 0.001%) and then pooled across these years. The 10 portfolios are formed by ranking the firms on their number of IR award nominations and dividing the total number of firms into 10 groups containing equal numbers of firms. The correlation coefficient measures the strength of the relationship between the firms' number of nominations and their analyst following. Analyst following numbers are taken from the average number of estimates at the year end in which the firm is nominated for an IR award shown in the Thomson Financial *FirstCall I/B/E/S* database.

Small Firms N = 2,054

Mean Annual Analyst Following

	T-2	T-1	T	T+1	T+2	N
Average	**3.5**	**3.7**	**3.9**	**2.5**	**2.4**	**2,054**
Portfolio						
1	6.2	7.0	6.8	5.5	5.2	**385**
2	3.6	3.6	4.0	2.1	2.0	**389**
3	0.9	0.4	1.0	0.0	0.0	**1,280**
Average	**3.5**	**3.7**	**3.9**	**2.5**	**2.4**	
Portfolio	**T-2**	**T-1**	**T**	**T+1**	**T+2**	**N**
1	6.7	7.7	7.4	6.2	5.9	**206**
2	5.5	6.1	6.1	4.6	4.4	**205**
3	4.1	4.2	4.5	2.7	2.6	**205**
4	2.6	2.3	2.9	0.8	0.8	**205**
5	1.9	1.4	2.1	0.0	0.0	**205**
6	1.4	0.6	1.5	0.0	0.0	**205**
7	0.9	0.1	1.0	0.0	0.0	**205**
8	0.5	0.0	0.6	0.0	0.0	**205**
9	0.2	0.0	0.3	0.0	0.0	**205**
10	0.0	0.0	0.0	0.0	0.0	**208**
Average	**3.5**	**3.7**	**3.9**	**2.5**	**2.4**	
Correlation coefficient	0.811	0.832	0.811	0.860	0.860	
Portfolio	**T-2**	**T-1**	**T**	**T+1**	**T+2**	**N**
1-5	4.2	4.3	4.6	2.9	2.7	**1,026**
6-10	0.6	0.6	0.7	0.0	0.0	**1.028**
Total						**2,054**

Table 7.2.1.3
Results for large and small US firms nominated for Best Overall IR 2000 to 2002 average number of analysts by portfolio

This table shows the average number of analysts following the US companies nominated in the Best IR Awards in 2000 to 2002.The 3 pooled portfolios are the firms nominated in the IR award in 2000, 2001 and 2002 divided into three portfolios 1,2 and 3, based on the ranked percentile of their number of IR award nominations (100% to 66.7%, 66.6% to 33.4%, 33.3% to 0.001%) and then pooled across these years. The 10 portfolios are formed by ranking the firms on their number of IR award nominations and dividing the total number of firms into 10 groups containing equal numbers of firms. Analyst following numbers are taken from the average number of estimates at the year end in which the firm is nominated for an IR award shown in the Thomson Financial *FirstCall I/B/E/S* database.

Large and Small Firms N = 3,113

Mean Annual Analyst Following

	T-2	T-1	T	T+1	T+2	N
Average	9.0	9.5	9.7	7.0	6.5	3,113
Portfolio						
1	15.7	16.7	16.7	12.7	11.7	687
2	9.5	10.5	10.4	7.7	7.1	635
3	1.8	1.5	2.0	0.8	0.7	1,791
Average	9.0	9.5	9.7	7.0	6.5	

Portfolio	T-2	T-1	T	T+1	T+2	N
1	19.7	20.7	20.7	16.7	15.7	311
2	13.6	14.6	14.6	10.6	9.6	311
3	12.0	13.0	13.0	9.0	8.0	311
4	9.2	10.2	10.0	7.7	7.1	311
5	5.3	5.8	5.9	4.3	4.1	311
6	3.1	2.9	3.4	1.4	1.3	311
7	1.8	1.2	2.0	0.0	0.0	311
8	1.0	0.2	1.1	0.0	0.0	311
9	0.4	0.0	0.5	0.0	0.0	311
10	0.1	0.0	0.1	0.0	0.0	314
Average	9.0	9.5	9.7	7.0	6.5	
Correlation coefficient	0.810	0.800	0.803	0.840	0.854	

Portfolio	T-2	T-1	T	T+1	T+2	N
1-5	12.0	12.9	12.8	9.7	8.9	1,555
6-10	1.3	0.9	1.4	0.3	0.3	1,558
Total						3,113

7.2.1.4 Regression analysis results

The regression results for equations 2 (a) and 2 (b), which are described in section 6.3.4, to test for a relationship between the firms' number of award nominations and analyst coverage, controlling for firm size, are set out in stable 7.2.1.4. The first section of this table shows the results of tests with analyst following as the dependent variable in regression equation 2 (a), shown again below. These results therefore indicate how effective IR, as measured by the firms' IR ratings, may affect levels of analyst coverage and are as follows:

Results for equation 2 (a): $AF_{iT} = \gamma_0 + \gamma_1 IR_i + \gamma_2 MV_{iT} + \varepsilon_{iT}$

US large firms - table 7.2.1.4 also shows that, controlling for market value, there is a strong and significant positive relationship between analyst coverage and the firms' number of IR award nominations *in the periods preceding the IR award nominations* at a 0.01 significance level, (t= 3.91, 3.91 and 3.79 in T-2, T-1 and T), whereas this relationship is still positive, but only significant at a 0.10 level in two-tailed tests and at a 0.05 level in one-tailed directional tests, in the periods following the *IR awards* (t=1.87 in T+1 and T+2).

US small firms - the results in the second panel of table 7.2.1.4 show that, as with the larger-sized firms, levels of analyst following of the smaller firms are significantly positively related to the market value of the firms. The table also shows that, in all periods T-2 to T+2, the relationship between perceived IR performance and analyst coverage is positive and highly significant at a 0.01 level (the t statistic is over 6 in all periods). The coefficients indicate that that for each extra analyst following a small firm it received almost one extra IR award nomination, and that analyst following levels also continue to be positively related to the firms' number of IR award nominations in the following years.

US combined large and small firms - the final panel in the first section of table 7.2.1.4 below shows that for the firms of all sizes, there is a positive and significant relationship between IR analyst coverage and IR award nominations in one-tailed directional tests at a 0.01 level, in all period T-2 to T+2. This relationship is also significant in two-tailed significance tests at a 0.05 level in the prior periods, T-2 to T (t=2.43, 2.34 and 2.36) and at a 0.01 level in the subsequent periods T+1 and T+2

(t= 2.67 and 2.79). These results **show that effective IR across** the combined sample of large and small firms **appears to 'drive' or lead to** higher levels of analyst coverage in the three years preceding the awards, also in the two following years.

Results for equation 2 (b) $IR_i = \gamma_0 + \gamma_1 AF_{iT} + \gamma_2 MV_{iT} + \varepsilon_{iT}$

The results of these tests are in the second section of table 7.2.1.4 and show how pre-existing levels of analyst coverage may be 'driving' or leading the size of the firms' IR ratings, which is the dependent variable in this equation.

US large firms - the regression coefficients in all periods T-2 to T+2 are positive and highly significant (the t statistics are all over 20), suggesting that analyst coverage levels may be determining the size of the firms' IR ratings. In all of these periods the results indicate that for one extra analyst the firms receive over 0.5 extra IR award nominations (the coefficients are all 0.531).

US small firms - for the set of smaller firms, the coefficients for the analyst coverage variable (AF) are also all positive and highly significant in all periods T-2 to T+2, with t statistics as high as 75.92 in period T+2 (coefficient of 0.86 indicates that for one extra analyst a firm receives over 0.8 extra IR award nominations.

US large and small firms - for the combined sample of firms there are positive and significant regression results for the AF variable in all periods T-2 to T+2 with t statistics over 23 in all these periods and the coefficients indicate that, for all firms, they receive approximately 0.5 more IR award nominations for each extra analyst that covers them (i.e. the coefficients average approximately 0.5 across all these periods).

This concludes the section describing the results of my tests for any relationship between analyst coverage and effective IR of the US firms. The table of results of my regression analyses is shown below and all my findings described above are further discussed in sections 7.2.3 to 7.2.5, following my description of the results of the tests on levels of analyst coverage of the UK firms with effective IR in the following section.

Table 7.2.1.4

Results for all US firms nominated for Best Overall IR 2000 to 2002 analyst coverage regression estimation

This table shows the results of testing for any relationship between analyst following and effective IR, controlling for firm size. The following regression is estimated:

$AF_{iT} = \gamma_0 + \gamma_1 IR_i + \gamma_2 MV_{iT} + \varepsilon_{iT}$ **2 (a)**

AF_{iT} = Number of analysts publishing forecasts in *I/B/E/S FirstCall* database for firm i in year T, MV_{iT} = market value of firm i at 31 March in year T, ε_{iT} = the error term in year T and IR_i = IR rating of firm i, where T = the 12-month period immediately preceding 31 March in the year of each IR award.

Large Firms N = 1,059

	T-2		T-1		T		T+1		T+2	
	Coeff.	**t**	**Coeff.**	**t**	**Coeff.**	**t**	**Coeff.**	**t**	**Coeff.**	**t**
γ_0	1.730	2.92	**1.829**	2.51	1.717	2.60	0.887	1.10	0.887	1.10
IR	**0.077**	**3.91**	**0.077**	**3.91**	**0.076**	**3.80**	**0.076**	**1.87**	**0.076**	**1.87**
MV	0.040	2.06	0.040	2.06	0.042	2.09	0.041	2.08	0.041	2.08
R^2	0.593		0.593		0.578		0.588		0.593	

Small Firms N = 2,054

	T-2		T-1		T		T+1		T+2	
	Coeff.	**t**	**Coeff.**	**t**	**Coeff.**	**t**	**Coeff.**	**t**	**Coeff.**	**t**
γ_0	0.329	7.58	0.330	6.58	0.366	7.60	0.713	8.99	0.677	8.99
IR	**0.808**	**6.41**	**0.829**	**6.66**	**0.808**	**6.41**	**0.858**	**7.90**	**0.858**	**7.92**
MV	0.036	2.78	0.035	2.82	0.037	2.83	0.026	2.29	0.026	2.31
R^2	0.811		0.833		0.811		0.860		0.860	

Large and Small Firms N = 3,113

	T-2		T-1		T		T+1		T+2	
	Coeff.	**t**	**Coeff.**	**t**	**Coeff.**	**t**	**Coeff.**	**t**	**Coeff.**	**t**
γ_0	0.395	3.83	0.399	3.53	0.434	3.97	0.265	2.92	0.241	2.85
IR	**0.326**	**2.43**	**0.316**	**2.34**	**0.318**	**2.36**	**0.360**	**2.67**	**0.376**	**2.79**
MV	0.541	4.03	0.543	4.03	0.544	4.05	0.512	3.80	0.498	3.69
R^2	0.673		0.670		0.672		0.670		0.669	

Table 7.2.1.4 continued.

Results for all US firms nominated for Best Overall IR 2000 to 2002 analyst coverage regression estimation

This table shows the results of testing whether high analyst following leads effective IR. The following regression is estimated:

$IR_i = \gamma_0 + \gamma_1 AF_{iT} + \gamma_2 MV_{iT} + \varepsilon_{iT}$ **2 (b)**

AF_{iT} = Number of analysts publishing forecasts in *I/B/E/S FirstCall* database for firm i in year T, MV_{iT} = market value of firm i at 31 March in year T, ε_{iT} = the error term in year T and IR_i = IR rating of firm i, where T = the 12-month period immediately preceding 31 March in the year of each IR award.

Large Firms N = 1,059

	T-2		T-1		T		T+1		T+2	
	Coeff.	**t**	**Coeff.**	**t**	**Coeff.**	**t**	**Coeff.**	**t**	**Coeff.**	**t**
γ_0	-15.564	-14.55	-16.921	-14.97	-16.921	-14.97	-11.493	-12.88	-10.136	-12.13
AF	**0.531**	**20.31**	**0.530**	**20.30**	**0.531**	**20.31**	**0.531**	**20.31**	**0.531**	**20.31**
MV	0.011	0.43	0.011	0.43	0.011	0.43	0.011	0.426	0.011	0.426
R^2	0.281		0.281		0.281		0.281		0.281	

Small Firms N = 2,054

	T-2		T-1		T		T+1		T+2	
	Coeff.	**t**	**Coeff.**	**t**	**Coeff.**	**t**	**Coeff.**	**t**	**Coeff.**	**t**
γ_0	0.430	13.91	0.726	27.98	0.430	13.89	0.930	42.07	0.930	42.07
AF	**0.811**	**62.41**	**0.833**	**67.66**	**0.811**	**62.41**	**0.860**	**75.90**	**0.860**	**75.92**
MV	-0.003	-0.213	-0.005	-0.413	-0.003	-0.26	-0.002	-0.188	-0.002	-0.21
R^2	0.657		0.692		0.657		0.739		0.739	

Large and Small Firms N = 3,113

	T-2		T-1		T		T+1		T+2	
	Coeff.	**t**	**Coeff.**	**t**	**Coeff.**	**t**	**Coeff.**	**t**	**Coeff.**	**t**
γ_0	-0.158	-0.97	-0.067	0.42	-0.182	-1.10	0.166	1.11	0.133	0.90
AF	**0.489**	**24.27**	**0.475**	**23.40**	**0.479**	**23.62**	**0.519**	**26.72**	**0.531**	**27.85**
MV	-0.004	-6.60	-0.041	-6.16	-0.128	- 6.32	-0.138	-7.13	-0.139	-7.30
R^2	0.179		0.170		0.172		0.206		0.219	

UK firms' analyst coverage

The results for UK firms showing levels of analyst coverage by portfolios of firms over the periods T-2 to T+2 and of the regression analyses described in section 6.3.4 to test for any relationship between effective IR and analyst coverage, controlling for firm size, set out in table 7.2.2, immediately following my discussion of these results below [9].

7.2.2.1 Best IR Officer Award

Average number of analysts

Table 7.2.2 shows that the average number of analysts following each of the 461 firms nominated for *Best IR Officer* does not vary significantly from the periods prior to periods following the IR awards, at approximately 7.5 in all periods that I test. In T-2 average coverage is 7.6 analysts per firm, and in consecutive years T-1, T, T+1 and T+2 the average is 7.5, 7.7, 7.5 and 7.4. However, table 7.2.2 also shows that, in all the periods T-2 to T+2, the firms in portfolio 1 have the highest average levels of analyst-following, portfolio 2 the second highest and portfolio 3 the lowest, but that the highest coverage level of the firms in portfolio 1 is 8.2 analysts per firm in periods T-2 and period T. Also, the correlation coefficients between the firms' numbers of award nominations and analyst coverage are positive and approximately 0.6 in each period. Overall, these findings suggest a positive relationship between analyst following and firms' IR ratings and that analyst following is *higher prior to when the IR ratings are given to firms.*

Regression analysis results for 'Best IR Officer'

The results described below are for equation 2 (a) $AF_{iT} = \gamma_0 + \gamma_1 IR_i + \gamma_2 MV_{iT} + \varepsilon_{itT}$ described in section 6.3.4. The signs of the regression coefficients of the relationship between analyst coverage and the market value of the firms shown in table 7.2.2 are positive but insignificant in each of the periods. However, the

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[9] As described in section 6.3.4., two regression analyses are performed to test the relationship between analyst coverage and the UK firms IR ratings. The results described in this section relate only to those from equation 2 (a) $AF_{iT} = \gamma_0 + \gamma_1 IR_i + \gamma_2 MV_{iT} + \varepsilon_{itT}$ because none of the results from the test using equation 2 (b), $IR_{iT} = \gamma_0 + \gamma_1 AF_{iT} + \gamma_2 MV_{iT} + \varepsilon_{itT}$ are significant. The implications of the results described in this section and of the insignificant results from equation 2 (b) are discussed in section 7.2.3 to 7.2.5 below.

coefficients indicating a relationship between the IR performance of the firms and analyst following are also positive and are significant in each period. This relationship is significant at a 0.05 level (one-tailed) and at a 0.10 level (two-tailed) in T-2 (t= 1.688), at a 0.025/0.05 level in periods T-1 (t=1.97) and T (t=1.98) and positive and significant at a 0.10/0/05 level in T+1 (t=1.69). Therefore, controlling for firm size, a higher number of nominations for Best IR Officer are subsequently given to firms with higher analyst coverage in the periods preceding the month of their nominations and firms with more nominations continue to have higher analyst following in the year following the IR awards compared to other nominated firms.

7.2.2.2 Best Results Meeting Award

Average number of analysts

The second panel of table 7.2.2 shows that the levels of analyst coverage for firms nominated for *Best Results Meetings with Fund Managers and Analysts* are similar to those for the *Best IR Officer* award category and similarly do not vary greatly across the periods. Although the correlation coefficients again do not indicate a strong relationship between nomination numbers and analyst following (the mean is 0.57 across the five periods), the table shows that portfolio 1 attracts the highest coverage in most periods compared to the other firms. The highest level for portfolio 1 is in the *periods prior to the IR awards*, at 8.5 analysts per firm in T-2, 8.0 in T-1 and 8.1 in T falling to 7 analysts per firm in T+1 and T+2. Meanwhile, portfolios 2 and 3 attract approximately 7 analysts per firm in periods T-2 to T+1, but in T+2 this rises slightly to 7.6 analysts, although this is the only period during which these firms have higher analyst coverage than firms in portfolio 1.

Regression analysis results for 'Best Results Meeting'

The results described below are for equation 2 (a) $AF_{iT} = \gamma_0 + \gamma_1 IR_i + \gamma_2 MV_{iT} + \varepsilon_{itT}$ described in section 6.3.4. The regression coefficients in the second panel of table 7.2.2 show that the relationship between the number of analysts and market value of the firm is positive and significant in all of the periods, indicating that more analysts follow larger sized firms. The coefficients showing the relationship between the firms' number of IR award nominations and analyst following are also positive and

significant and positive at a 0.01 level in the prior periods T-1 (t=2.54) and at a 0.025 level in T (t=2.20) in directional tests and continue to be significant with a 0.025 one-tailed significance level in T+2 (t=1.99) but, although still positive, are insignificant in T-2 and in T+1.

7.2.2.3 Best Annual Report

Average number of analysts

The final panel in table 7.2.2 shows the average analyst following for firms nominated for *Best Annual Report*. Although analyst following is marginally higher in period T, at 7.9 analysts compared to 7.6 in T-1 and 7.7 in T+1, coverage levels do not vary significantly across the periods I test. However, the table does show that firms in portfolio 1 attract the highest analyst coverage in all of the periods, peaking at 9.7 analysts per firm in period T when portfolio 2 firms have 6.9 per firm and portfolio 3 has 7 analysts per firm. The correlation coefficients also show that the relationship between nominations and analyst coverage is positive and averages at approximately 0.6 across the periods.

Regression analysis results for 'Best Annual Report'

The results described below are for equation 2 (a) $AF_{iT} = \gamma_0 + \gamma_1 IR_i + \gamma_2 MV_{iT} + \varepsilon_{itT}$ described in section 6.3.4. The final panel in table 7.2.2 shows significant and positive relationships between analyst coverage and IR nomination numbers (0.01 significance level) in periods T-1 (t=2.33) and T (t=3.60), showing that when these firms have higher analyst coverage they also subsequently receive a higher number of nominations in the IR awards. There is also a positive relationship between numbers of award nominations and subsequent analyst coverage, which are significant in period T+2 and at a 0.01 level (t=1.68) in two-tailed tests and at a 0.05 level in directional testing.

This concludes the section describing the results of my tests for any relationship between analyst coverage and effective IR for the UK firms. The tables of results of these tests are set out on the following pages, and in section 7.2.3 I review my results on the US and UK firms' levels of analyst coverage.

Table 7.2.2.
Results for UK firms nominated 1999 to 2002 average number of analysts by portfolio and regression estimation

This table shows the average number of analysts following the UK companies nominated in the Best IR Officer, Best Results Meeting and Best Annual Report IR Awards in 1999 to 2002 for all nominated companies divided into three portfolios. The pooled samples are all firms nominated in the IR awards in 1999, 2000, 2001 and 2002 divided into three portfolios ½/3 based on the ranked percentile of IR Score (100% to 66.7%, 66.6% to 33.4%, 33.3% to 0.001%). Analyst following numbers are taken from the average number of estimates at the year end in which the firm is nominated for an IR award shown in the Thomson Financial *FirstCall I/B/E/S* database. The table also shows the results of testing the relationship between IR rating for all nominated companies and the number of analysts in the year in which the firm is nominated, whilst controlling for market value. The correlation coefficient measures the strength of the relationship between the firms' number of nominations and their analyst following.
The following regression is estimated:

$$AF_{iT} = \gamma_0 + \gamma_1 IR_i + \gamma_2 MV_{iT} + \varepsilon_{itT} \quad 2(a)$$

where:
AF iT = Number of analysts publishing forecasts in *I/B/E/S FirstCall* database for firm i in year T, the 12-months immediately preceding 31 March in the year of each IR award.
MviT = Market Value of firm i at 31 March in year T,
IR iT = IR rating of firm i in year T

Best IR Officer Award N = 461

	T-2	T-1	T	T+1	T+2	N
Average	**7.6**	**7.5**	**7.7**	**7.5**	**7.4**	
Portfolio						
1	8.2	7.9	8.2	8.0	7.9	**153**
2	7.3	7.6	7.5	7.9	7.6	**147**
3	7.2	6.9	7.4	6.7	6.8	**161**
Average	**7.6**	**7.0**	**7.7**	**7.0**	**7.0**	**461**
Correlation coefficient	0.562	0.575	0.596	0.619	0.620	

Regression

	T-2		T-1		T		T+1		T+2	
	Coeff	**t**	**Coeff**	**t**	**Coeff**	**t**	**Coeff**	**t**	**Coeff**	**t**
γ_0	0.495	9.835	0.497	10.078	0.496	10.064	0.497	10.228	0.503	10.177
IR	**0.079**	**1.688**	**0.080**	**1.971**	**0.082**	**1.976**	**0.081**	**1.749**	**0.072**	**1.553**
MV	0.026	0.561	0.026	0.546	0.026	0.551	0.015	0.322	0.016	0.337
R^2	0.002		0.002		0.003		0.003		0.001	

Table 7.2.2. continued.
Results for UK firms nominated 1999 to 2002 average number of analysts by portfolio and regression estimation

Best Results Meeting Award N = 412

	T-2	T-1	T	T+1	T+2	N
Average	7.7	7.4	7.5	7.0	7.4	
Portfolio						
1	8.5	8.0	8.1	7.0	7.0	136
2	7.2	7.3	7.3	6.8	7.6	133
3	7.5	7.0	7.0	7.2	7.6	143
Average	7.7	7.4	7.5	7.0	7.4	
Correlation coefficient	0.581	0.531	0.481	0.581	0.631	

Regression

	T-2		T-1		T		T+1		T+2	
	Coeff.	T	Coeff.	T	Coeff.	T	Coeff.	T	Coeff.	T
%	0.387	9.702	0.375	9.602	0.384	9.841	0.375	9.607	0.364	9.291
IR	0.004	1.075	0.027	2.539	0.011	2.204	0.027	1.533	0.049	1.985
MV	0.196	3.717	0.189	3.710	0.193	3.675	0.189	3.713	0.185	3.686
R^2	0.034		0.035		0.034		0.035		0.037	

Best Annual Report Award N = 381

	T-2	T-1	T	T+1	T+2	N
Average	7.7	7.6	7.9	7.7	7.5	
Portfolio						
1	8.6	8.7	9.7	8.8	7.8	126
2	7.1	7.0	6.9	7.7	7.4	121
3	7.4	7.1	7.0	6.6	7.4	134
Average	7.7	7.6	7.9	7.7	7.5	
Correlation coefficient	0.547	0.572	0.576	0.688	0.550	

Regression

	T-2		T-1		T		T+1		T+2	
	Coeff.	T	Coeff.	t	Coeff.	t	Coeff.	t	Coeff.	t
%	0.408	10.404	0.394	10.181	0.331	8.526	0.392	10.161	0.329	8.475
IR	0.041	0.782	0.069	2.329	0.183	3.595	0.073	1.406	0.187	1.684
MV	0.034	0.642	0.033	0.645	0.035	0.681	0.033	0.634	0.037	0.726
R^2	-0.002		0.001		0.030		0.002		0.032	

7.2.2 Addressing the research hypotheses on analyst coverage

As described above, the US firms with the highest number of nominations have a significantly higher level of analyst following compared to the firms with fewer nominations. Coverage of the larger sized firms in the top 50% of firms, when ranked in order of the number of their nominations, is on average 18.2 per firm compared to the firms in the lowest 50% that have an average of 13.5 analysts per firm. Also, these levels of coverage are persistent; that is, the firms with a certain number of nominations in the IR awards attract a relatively constant level of analysts over time.

Analyst following of the US smaller firms, as expected based on the prior literature, is lower compared to the number of analysts following larger sized firms (an overall average of 3.9 compared to 16.3), but is also higher for the firms with more IR award nominations compared to firms with fewer nominations. In the case of the small firms, the top portfolio of 1,026 firms of the 2,054 total have on average 4.6 analysts each in the 12-months leading up to the IR award, whereas the least often nominated 50% have only an average of 0.7 per firm.

The results of both of the regression analyses to test the relationship between analyst coverage and IR ratings, controlling for firm size, both by separate samples of 'large firms' and 'small firms' and across 'large and small firms' show significant relationships between coverage and IR award nominations in *periods both prior to and subsequent to their nomination for 'Best Overall IR' performance*. Notably, though, whilst both showing significant positive results, the results of equation 2(b) for US firms, which takes IR ratings as the dependent variable, are statistically much stronger than those for equation 2 (a), which takes levels of analyst coverage and the dependent variable. Meanwhile, only results for running equation 2(a) are significant for UK firms. The aims of conducting these two types of tests were both to test for the existence of any relationship between more effective IR and analyst coverage and also to test for any lead or lag effects. And the implications of my findings are that, whilst effective IR is related to higher analyst coverage, based on

the stronger results for equation 2(a), higher analyst coverage appears to 'lead' effective IR more than 'lag' effective IR.

For UK firms, the firms given more nominations in the UK IR awards also have higher analyst coverage, although the level of coverage is slightly lower than for the US firms (*Best IR Officer* firms have an average of 7.7 analysts per firm in the 12-months leading up the IR award, *Best Results Meeting* firms have 7.5 per firm and firms nominated for *Best Annual Report* have 7.9 per firm on average). The regression results of regression equation 2(a) for the UK firms show that, even controlling for the effect of firm size on analyst coverage, the relationship between the firms' number of nominations and the number of analysts following them is positive and significant, *but the significance of this relationship is stronger in the periods prior to their nomination compared to the following years* (seen by the t statistics in table 7.2.2), indicating that more effective IR is associated with higher analyst following. Meanwhile, as noted above, the regression results to test for any 'lead' effect between higher pre-existing levels of analyst coverage and IR ratings of equation 2(b) are insignificant, suggesting that more effective IR 'leads', more than 'lags' higher analyst coverage.

Prior to my conclusions on my tests concerning the firms' analyst coverage, in the following section I place all of the findings described above in the context of relationships between effective IR and analyst following that are predicted by relevant theory.

7.2.4 Theory

My findings on the relationship between high levels of analyst coverage for the firms with high ratings for effective IR are consistent with the IR award survey respondents being subject to some decision-making biases described in the behavioural finance literature. Specifically, behavioural finance suggests that the bias of *representativeness* can explain how some 'favoured' characteristics about firms can cause decision-makers to create a mental 'halo' over firms that possess these characteristics that they carry-over to other attributes of the firm. If analysts have a

positive bias towards following large firms over smaller firms then analyst following will be higher for larger-sized firms and they are more likely to nominate the firms they already follow for the IR awards, perhaps regardless of their financial performance.

Also, although my regression test results indicate that high analyst coverage appears to 'lead' rather than 'lag' the firms' being nominated for effective IR, the relationship I find between coverage and the number of IR award nominations for the firms is positive across all years that I test, both prior to and also following the nomination month. This suggests that, once attracted to a firm with effective IR, analysts follow firms consistently over time. Firms with effective IR may enter a form of *'virtuous analyst coverage circle'*, whereby investors and other capital market participants are better informed about the firms for whom many analysts produce a wealth of analysis and information and are thereby rendered more 'available', as described in the behavioural finance literature, formalised in the psychological bias of *'availability'*, whereby more familiar choices are favoured by decision-makers.

7.2.5 Conclusion on analyst coverage

In summary, the test results show that the firms with high prior levels of analyst coverage receive higher subsequent IR ratings by the respondents to the IR award survey. Further, the positive relationship between the IR rating and analyst coverage persists beyond the nomination date, although the level of analyst coverage does not significantly increase over future periods. Overall, this means that null hypothesis *H02* cannot be rejected at normal significance levels, **that *there is no significant relationship between effective IR and future increased levels of analyst coverage.*** On the contrary the results for both the US firms and UK firms provide significant evidence to reject the null hypothesis *H06*, **that *there is a no significant relationship between effective IR and prior high levels of analyst coverage.***

This concludes the section on the empirical tests of analyst coverage. My findings on the relationship between effective IR and analyst coverage are discussed more fully in chapter 8.

7.3 Equity Trading Volumes

Introduction

In this section I describe the results of the tests described in section 6.4 that are designed to test the null hypothesis that stock liquidity is not higher subsequent to the firms' nominations in the IR awards that I developed in chapter 5:

H03: There is no significant relationship between effective IR and ***future increased trading volumes of equity.***

Section 7.3.1 describes the US firm results and section 7.3.2 results for the UK firms. Section 7.3.3 reviews how my findings relate to null hypothesis H03 and in section 7.3.4 I review how they relate to theory. I conclude on stock liquidity in section 7.3.5.

7.3.1 US firms' equity trading

The results are set out in table 7.3.1.1 to 7.3.1.7.

7.3.1.1 Relative equity trading volumes (RV)

RV measures stock liquidity in terms of average monthly trading volume over 12-month periods as a percentage of the average monthly trading volume of the average firm in the same industry sector over the same 12-months, thus largely controlling for industry-specific factors that may affect trading volumes. Although the RV measure does not specifically control for firm size, the regression tests I perform, which are described below in section 7.3.1.3 for US firms, do control for firm size.

US large firms

Table 7.3.1.1 shows that the firms in portfolio 1 have the highest average RV in both periods T and T+1, at 3.11 times 'normal volume' in T and increasing to 3.63 times in T+1, which are higher than the equivalent combined RV of portfolios 2 and 3 (1.17 in T and 1.45 in T+1). Portfolio 1 firms also show the largest *increase* in RV as a percentage of the average firm in their industry sector (measured by the DRV) with a DRV of 0.52, which is higher than the average DRV of portfolios 2 and 3 which, as shown in table 7.3.1.1, is 0.28. Also, a one-tailed t test of the difference in mean RV

across all 1,059 large firms between period T-1 and period T is statistically significant at a 0.10 level (t=1.35) and the general rise in their stock liquidity (volumes) is shown by the percentages of positive and negative DRV statistics, which are positive for 61.6% of these large-sized firms.

US small firms

As expected, trading volumes for the smaller firms are much lower than for the larger firms, which is indicated by the significantly smaller RV results for the smaller firms. The RV measure of liquidity rises for all three portfolios of firms from T to T+1. The firms in portfolio 1 have (marginally) the highest average RV in both periods, at 0.046 rising to 0.050, although portfolio 2 shows the largest *percentage* increase (DRV is 0.0095 compared to 0.0042). Although the t test of the difference in mean RV across all the 2,054 small firms shows that the rise in liquidity is not large enough to be statistically significant, the DRV statistic is still positive for 63.2% of the firms, showing that in general the liquidity of the smaller firms with effective IR clearly rose between periods T and T+1.

US large and small firms

Unsurprisingly, given the results described above, the RV statistic increases across all firms in the combined sample of large and small firms from period T to T+1. In addition, the firms with higher IR ratings exhibit higher increases in this liquidity measure compared to the firms with lower ratings (DRV is 0.21 for portfolio 1, 0.13 for portfolio 2 and 0.01 for portfolio 3). Finally, the DRV statistic is positive for 1,949 firms out of 3,113 (62.6%) and negative for 37.4%, reflecting the general increase in liquidity for across all of the US firms (although again not large enough to be statistically significant). Therefore, overall, stock liquidity levels rise in general following the IR awards and appear to be positively associated with the firms' ratings for IR effectiveness.

7.3.1.2 Liquidity ratio (LR)

LR measures the *price-elasticity* of the firm's stock, because it measures changes in trading volumes that are associated with a unit change in stock price. Although LR also does not control for firm size, a change in the LR (DLR) is a ratio that shows the sign and size of the change in price elasticity and so provides a measure of a rise or

fall in the 'market depth' of the firms' stocks, i.e. a DLR of <1 indicates a fall in stock liquidity falls.

US large firms

Table 7.3.1.4 shows that LR rises across all firms from T to T+1. It also shows that LR of the firms in the portfolio with most nominations (portfolio1) *more than doubles* between period T to T+1 (DLR is 2.04 for portfolio1, more than twice that of portfolio 2, at 0.79, and also higher than portfolio 3 firms, at 1.04), indicating that the firms perceived to have the *most effective IR* have a much higher rise in liquidity (the apparent fall in liquidity of firms in portfolio 2 is unexpected, whilst LR for portfolio 3 rises). Although the t test results show that the change in mean LR across the sample of large firms alone is not significant, DLR is >1 for 55.32% of the firms, indicating that in general liquidity rises for large firms with effective IR.

US small firms

Contrary to the RV results for the US small firms described above, when measured by LR stock liquidity of the firms in portfolio 1 is the highest of the portfolio groups in both periods T and T+1 (because LR measures changes in volumes in relation to changes in stock returns i.e. of the *price elasticity* of traded volumes). Although LR for both portfolios 2 and 3 increase from T to T+1 (portfolio 2 LR is 1.76 in T with a DLR of 1.05 and portfolio 3 is 1.48 with a DLR of 1.12), portfolio 1 has a DLR of 1.38 and so exhibit the highest *increase* in liquidity over the periods. Meanwhile, the rise in the size of LR across the small firms is significant at a 0.05 level (t= 1.69) and DLR is >1 for slightly over 50% of the firms (1,034 out of 2,054).

US large and small firms

Table 7.3.1.6 shows once more that portfolio 1 has the highest LR in both periods (6.77 in period T with a two-fold increase to 12.10 in period T+1), whereas average LR across of all other firms is approximately 3.0 in both periods. LR of portfolio 3 also rises from 3.11 to 3.32, although for portfolio 2 LR *falls* from 3.04 to 2.67 (DLR for portfolio 2 of less than 1, at 0.88). In summary, the firms with the most award nominations have both the highest stock liquidity in each period and also and the highest increases in liquidity. Finally, LR is >1 for 52% of all US firms although, as noted above, whilst the t test for the change in mean LR is significant for the 2,054 small firms, for the combined sample of large and small firms the absolute rise in

mean LR is not significant. So far, the tests of liquidity have controlled only for industry sector factors that may affect stock liquidity. The regression analysis results described below control both for the industry sector and market value of the firms.

7.3.1.3 Regression analysis

The results of the regression model, to test the relationship between the US firms' IR rating and equity trading volumes, controlling for firm size and equity beta, are shown in Table 7.3.1.7. The regression equation is set out in section 6.4.3.5 (equation (7)). Firstly, consistent with existing literature that has shown that stock liquidity is higher for lower risk and larger-sized firms, the coefficients show that the firms' equity trading volumes are negatively related to equity risk beta, although none of the results are significant. However there are significant and positive coefficients for the firms' market value variable that are significant at a 0.05 level in one-tailed tests in period T for the small firms and at a 0.01 level in period T and at a 0.10 level in period T +1 for the combined sample of large and small firms, although for the large firms alone they are not statistically significant. Table 7.3.1.7 also shows that trading volume is significantly positively related to the IR rating of the firms in periods T and T+1 but only for the *large firms*. The strength of this relationship is higher in period T (0.483 t = 16.95) but is still highly significant in T+1 (0.171 t = 5.31). This means that, controlling for differences in trading volumes related to risk and market size, the larger firms with higher equity trading volumes are subsequently given more IR award nominations and that the firms with more nominations also continue to have higher trading volumes over the following year (in period T t = 16.95 and in period T+1 t = 5.31). Whilst the coefficients showing any relationship between IR ratings and liquidity for the smaller firms in periods T and T+1 are both positive they are insignificant. However, the final panel in table 7.3.1.7 shows that when the smaller firms are combined with the larger firms there is again a strong, positive relationship between trading volume and IR ratings (t=23.20 in period T and t= 6.98 in T+1).

This concludes my discussion of the results of the tests for any relationship between effective IR and increased stock liquidity for the US firms. The tables of test results for the US firms are set out on the following pages.

Table 7.3.1.1.
Results for large US firms nominated for Best Overall IR 2000 to 2002 relative volumes (RV)

This table shows the average monthly relative volumes during 12-month periods T and T+1. Relative volume (RV) measures the traded volume of a stock as a percentage of the average traded volume of the stock of a firm in the same industry sector in the same month. The table also shows the results of a t test for the difference in average RV between year T and T+1 and also the number of companies for which the change in RV from T to T+1 (DRV) is positive or negative. DRV summarises the sign and size of the change in liquidity from before to after the company was nominated for the IR award. The table shows the number of companies in the sample where DRV is positive or negative.

Relative Volume $RV_{it} = V_{it} / (V_{mt}/N_{mt})$
Change in Relative Volume $DRV_{it} = RV_{it} . RV_{it-1}$

where:
V_{it} = the traded volume of stock of firm i during month t
V_{mt} = traded volume of stock in firm i's industry sector during month t
N_{mt} = number of firms listed in firm i's industry sector in the FTSE All Share/S&P indices at the end of month t
T = 12-month period preceding the month of the IR award nomination

Large Firms N = 1,059

Relative Volumes (RV)

Portfolio	RV T	RV T+1	DRV $_{it}$	N
1	3.11	3.63	0.52	**302**
2	1.07	1.18	0.11	**246**
3	1.26	1.71	0.45	**511**
				1,059
2+3	1.17	1.45	0.28	**757**

t-Test: Paired Two Sample for Means of RV in T and T+1

	T	T+1
Mean	1.78	2.22
Variance	288.29	426.80
Pearson Correlation	0.87	
Hypothesized Mean Difference	0	
t Stat	1.35	

Change in Relative Volumes (DRV) T to T+1

Sign of DRV	No of Cases	% Cases
-ve	407	38.43%
+ve	652	61.57%
	1,059	

Table 7.3.1.2.
Results for small US firms nominated for Best Overall IR 2000 to 2002 relative volumes (RV)

This table shows the average monthly relative volumes during 12-month periods T and T+1. Relative Volume measures the traded volume of a stock as a percentage of the average traded volume of the stock of a firm in the same industry sector in the same month. The table also shows the results of a t test for the difference in average RV between year T and year T+1 and also the number of companies for which the change in RV from T to T+1 (DRV) is positive or negative. DRV summarises the sign and size of the change in liquidity from before to after the company was nominated for the IR award. The table shows the number of companies in the sample where DRV is positive or negative.

Relative Volume $RV_{it} = V_{it} / (V_{mt}/N_{mt})$
Change in Relative Volume $DRV_{it} = RV_{it} . RV_{it-1}$

where:
V_{it} = the traded volume of stock of firm i during month t
V_{mt} = traded volume of stock in firm i's industry sector during month t
N_{mt} = number of firms listed in firm i's industry sector in the FTSE All Share/S&P indices at the end of month t
T = 12-month period preceding the month of the IR award nomination

Small Firms N = 2,054

Relative Volumes (RV)

Portfolio	RV T	RV T+1	DRV_{it}	N
1	0.046	0.049	0.0042	385
2	0.040	0.049	0.0095	389
3	0.021	0.024	0.0028	1,280
				2,054
2+3	0.031	0.037	0.0061	1,669

t-Test: Paired Two Sample for Means of RV in T to T+1

	T	T+1
Mean	0.03	0.03
Variance	0.02	0.07
Pearson Correlation	0.31	
Hypothesized Mean Difference	0	
t Stat	0.47	

Change in Relative Volumes (DRV)

Sign of DRV	No of Cases	% Cases
-ve	757	36.85%
+ve	1,297	63.15%
	2,054	

Table 7.3.1.3.
Results for large and small US firms nominated for Best Overall IR 2000 to 2002 relative volumes (RV)

This table shows the average monthly relative volumes during 12-months periods T and T+1. Relative Volume measures the traded volume of a stock as a percentage of the average traded volume of the stock of a firm in the same industry sector in the same month. The table also shows the results of a t test for the difference in average RV between year T and year T+1 and also the number of companies for which the change in RV from T to T+1 (DRV) is positive or negative. DRV summarises the sign and size of the change in liquidity from before to after the company was nominated for the IR award. The table shows the number of companies in the sample where DRV is positive or negative.

Relative Volume $RV_{it} = V_{it} / (V_{mt}/N_{mt})$

Change in Relative Volume $DRV_{it} = RV_{it} . RV_{it-1}$

where:

V_{it} = the traded volume of stock of firm i during month t

V_{mt} = traded volume of stock in firm i's industry sector during month t

N_{mt} = number of firms listed in firm i's industry sector in the FTSE All Share/S&P indices at the end of month t.

T = 12-month period preceding the month of the IR award nomination

Large and Small Firms N = 3,113

Relative Volumes (RV)

Portfolio	RV T	RV T+1	DRV $_{it}$	N
1	1.31	1.52	0.21	687
2	0.54	0.67	0.13	635
3	0.47	0.48	0.01	1,791
				3,113
2+3	0.51	0.57	0.07	2,426

t-Test: Paired Two Sample for Means in RV in T and T+1

	T	T+1
Mean	0.75	3.16
Variance	141.90	204.82
Pearson Correlation	0.20	
Hypothesized Mean Difference	0	
t Stat	0.94	

Change in Relative Volumes (DRV)

Sign of DRV	No of Cases	% Cases
-ve	1,164	37.39%
+ve	1,949	62.61%
	3,113	

Table 7.3.1.4.
Results for large US firms nominated for Best Overall IR 2000 to 2002 liquidity ratio (LR)

This table shows the average monthly liquidity ratios during T and T+1 by portfolio of firms. The Liquidity Ratio (LR) is a measure of 'market depth' as it measures the trading volume of a stock associated with a unit change in the stock price. The table also shows the change in the Liquidity Ratios (DLR) over periods T to T+1. This measures the change in traded volumes over time that is associated with a change stock return over the same period.

Liquidity Ratio $LR_i = \Sigma V_{it} / \Sigma |R_{it}|$
Change in liquidity ratio $DLR_i = LR_{iT+1} / LR_{iT}$
V_{it} = the traded volume of stock of firm i during month t
R_{it} = the return on stock of firm I in month t
The summation is performed over both the 12-months prior to and following the month of the award (T and T+1).

Large Firms N = 1,059

Liquidity Ratio (LR)

Portfolio	LR T	LR T+1	DLR	N
1	12.82	26.12	2.04	302
2	6.41	5.05	0.79	246
3	7.39	7.69	1.04	511

t-Test: Paired Two Sample for Means of LR in T and T+1

	LR T	LR T+1
Mean	8.73	12.41
Variance	5060.9	20732.9
Pearson Correlation	0.41	
Hypothesized Mean Difference	0.00	
t Stat	0.89	

Change in Liquidity Ratio (DLR)

DLR

	No of Cases	% Cases
<1	473	44.66%
>1	586	55.34%
	1,059	

Table 7.3.1.5.
Results for small US firms nominated for Best Overall IR 2000 to 2002 liquidity ratio (LR)

This table shows the average monthly liquidity ratios during T and T+1 by portfolio of firms. The Liquidity Ratio (LR) is a measure of 'market depth' as it measures the trading volume of a stock associated with a unit change in the stock price. The table also shows the Change in the Liquidity Ratios (DLR) over periods T to T+1. This measures the change in traded volumes over time associated with a change stock returns.

Liquidity Ratio $LR_i = \Sigma V_{it} / \Sigma |R_{it}|$
Change in liquidity ratio $DLR_i = LR_{iT+1} / LR_{iT}$
V_{it} = the traded volume of stock of firm i during month t
R_{it} = the return on stock of firm I in month t
The summation is performed over both the 12-months prior to and following the month of the award (T and T+1).

Small Firms N= 2,054

Liquidity Ratio (LR)

Portfolio	LR T	LR T+1	DLR	N
1	2.44	3.36	1.38	385
2	1.76	1.85	1.05	389
3	1.48	1.67	1.12	1,280

t-Test: Paired Two Sample for Means of LR in T and T+1

	LR T	LT T+1
Mean	1.72	2.03
Variance	36.71	44.60
Pearson Correlation	0.15	
Hypothesized Mean Difference	0.00	
t Stat	1.69	

Change in Liquidity Ratio (DLR)

DLR	No of Cases	% Cases
<1	1,020	49.66%
>1	1,034	50.34%
	2,054	

Table 7.3.1.6.
Results for large and small US firms nominated for Best Overall IR 2000 to 2002 liquidity ratio (LR)

This table shows the average monthly liquidity ratios during T and T+1 by portfolio of firms. The Liquidity Ratio (LR) is a measure of 'market depth' as it measures the trading volume of a stock associated with a unit change in the stock price. The table also shows the Change in the Liquidity Ratios (DLR) over periods T to T+1. This measures the change in traded volumes over time associated with a change stock returns.

Liquidity Ratio $LR_i = \Sigma V_{it} / \Sigma |R_{it}|$
Change in liquidity ratio $DLR_i = LR_{iT+1} / LR_{iT}$
V_{it} = the traded volume of stock of firm i during month t
R_{it} = the return on stock of firm I in month t
The summation is performed over both the 12-months prior to and following the month of the award (T and T+1).

Large and Small Firms N = 3,113

Liquidity Ratio (LR)

Portfolio	LR T	LR T+1	DLR	N
1	6.77	12.10	1.79	687
2	3.04	2.67	0.88	635
3	3.11	3.33	1.07	1,791
				3,113

t-Test: Paired Two Sample for Means of LR

	LR T	LR T+1
Mean	4.04	5.46
Variance	1705.3	6894.6
Pearson Correlation	0.41	
Hypothesized Mean Difference	0.00	
t Stat	1.03	

Change in Liquidity Ratio (DLR)

DLR	No of Cases	% Cases
<1	1,493	48.00%
>1	1,620	52.00%
	3,113	

Table 7.3.1.7.
Results for all US firms nominated for Best Overall IR 2000 to 2002 equity trading volumes regression analysis

This table shows the coefficients from estimating the following regression equation for the full pooled sample of US companies nominated in the IR Awards:

$$Vol_{iT} = \gamma_0 + \gamma_1 IR_{it} + \gamma_2 \log (MV)_{iT} + \gamma_3 \beta_{iT} + \epsilon_{iT}$$

Vol_{iT} = mean monthly volume of equity traded for firm i in year T
MV_{iT} = natural log of market value of equity capital of firm i at 31 March in year T
B_{iT} = equity beta of firm i in year T
ϵ_{iT} = error term in year T
IR_{it} = IR rating of firm i in year t
** indicates one-tailed statistical significance at the 0.01 level
* indicates one-tailed statistical significance at the 0.10 level
T = 1999 to 2003 (i.e. over discrete 12-month periods from one period prior to the first IR award in 2000, to one period subsequent to the final IR awards in 2002)
t = 2000 to 2002

Large Firms N = 1,059

		T		T+1	
		Coeff	**t stat**	**Coeff**	**t stat**
Intercept		-538	-0.014	14,536	0.115
Beta	**B**	-0.003	-0.095	-0.046	-1.509
Market Value	**MV**	0.024	0.844	0.014	0.431
IR Rating	**IR**	0.483	16.951**	0.171	5.305**
R^2		0.2400		0.0272	

Small Firms N = 2,054

		T		T+1	
		Coeff	**t stat**	**Coeff**	**t stat**
Intercept		22,785	1.692*	2,338	0.044
Beta	**B**	-0.033	-1.479*	-0.024	-1.068
Market Value	**MV**	0.036	1.502*	0.012	0.514
IR Rating	**IR**	0.029	1.243	0.011	0.447
R^2		0.0100		0.0010	

Large and Small Firms N = 3,113

		T		T+1	
		Coeff	**t stat**	**Coeff**	**t stat**
Intercept		8,144	0.637	-55,174	-1.181
Beta	**B**	-0.017	-1.018	-0.028	-1.522*
Market Value	**MV**	0.051	3.002**	0.028	1.451*
IR Rating	**IR**	0.396	23.196**	0.130	6.976**
R^2		0.1720		0.0190	

7.3.2 UK firms' equity trading volumes

I perform the same tests that are performed on the trading volumes of the US firms on the UK firms with effective IR. The results for UK firms are set out in table 7.3.2.1.to 7.3.2.7, immediately following on from my discussion of the salient results below.

7.3.2.1 Relative equity trading volumes (RV)

UK Best IR Officer Award

The RV results in table 7.3.2.1 indicate that all the firms' stock liquidity increases between period T to period T+1 and also show that the average for firms in portfolio is the highest in both periods (at 2.93 times 'normal volume' rising to 3.34) compared to the combined average RV of portfolios 2 and 3 (2.64 rising to 2.85). The change in relative volume (DRV) summarises this in percentage form and is 0.41 for portfolio 1, higher than for the lower-rated portfolios (0.30 for portfolio 2 and 0.12 for portfolio 3). In addition, the results of the t test show that the increase in the mean RV across all firms in this IR award category from T to T+1 is significant at a 0.025 level in a one-tailed test (t = 2.19). Finally, DRV is positive for 65.1% of the pooled sample of all firms (300 out of 461) and negative for 34.9%, showing that the majority of these firms exhibit higher liquidity during T+1 compared to T.

Best Results Meeting Award

The RV results in table 7.3.2.2 are higher for UK firms nominated for having Best Results Meetings compared to those noted above. However, portfolio 1 firms again have the highest average RV in both T and T+1 (4.63 to 4.85) and portfolio 2 have the second highest (3.99 to 4.76) and portfolio 3 the lowest (2.59 to 2.89). However the *percentage increases* in volumes from T to T+1 is highest for portfolio 2 firms (DRV is 0.77) compared to portfolio 1, with a DRV of 0.22, and portfolio 3 have a DRV of 0.30. Meanwhile, the t test shows that the rise in mean RV across all firms is significant at the 0.01 level for a one-tailed test (t = 2.35) and DRV is positive for 63.6% (262 out of 412) of firms and negative for 36.4%.

Best Annual Report

The RV results for this set of firms in table 7.3.2.3 are the lowest of the UK firms, although all portfolios show a rise in RV in T+1 compared to T. However, in this case portfolios 2 and 3 show a higher increase in RV compared to the average for

portfolio 1 firms (DRV is 0.4507 compared to 0.111). Finally, the size of the increase in average RV across all firms is significant at a 0.01 level in a one-tailed directional t test (t = 2.92) and the general rise in liquidity of the firms is also shown by percentages of positive and negative DRV results, which are positive for 63.7% of firms (or 245 of 381 firms).

7.3.2.2 Liquidity ratio (LR)

Best IR Officer Award

Between T and T+1 LR rises markedly across firms in all three portfolios by over approximately 150% (shown in table 7.3.2.) showing that the firms' trading volumes rise more *in relation to changes in their stock returns* than indicated by the RV measure results described above in sub-section 7.3.2.1. Also the t test shows that the increases in the mean LR across all nominated firms is statistically significant at the 0.025 level in a one-tailed test (t = 2.16) and the overall increase in volume/price elasticity of the firms is shown by 98.3% of the firms having a DLR >1. In addition, results show that in period T average LR is highest for portfolio 1 firms, then for portfolio 2 and portfolio 3 has that lowest (8.99, 8.59 and 5.84 respectively), which implies that share price is a more 'sensitive' to changes in levels of trading volumes for firms with higher IR ratings.

Best Results Meeting

In period T+1 LR results shown in table 7.3.2.5 again rise between period T and T+1 for firms in portfolios 1 and 2, although the liquidity ratio for portfolio 3 falls (DLR <1). In period T portfolio 3 has the highest LR, of 13.2, portfolio 1 have an LR of 10.76 and portfolio 2 an LR of 9.98. Therefore, the firms with higher IR ratings exhibit a higher *increase* in liquidity and this is also shown by the DLR results, where portfolio 1 and 2 firms have the highest DLR, at 1.9 and 2.8 and DLR for portfolio 3 is lower at 0.71. Finally, there is strong evidence that after the award nominations liquidity rises for all of the firms because DLR is >1 for 98.54% of the firms and <1 for only 6% and the t test shows that this increase in significant at a 0.10 level in a one-tailed test (t= 1.33).

Best Annual Report

Although portfolio 1 has an LR of 10.4 in period T, unexpectedly LR *falls* in period T+1 to 7.5 and LR also falls for portfolio 2, from 17.9 to 14.7, although the LR for

portfolio 3 rises from 6.3 to 12.3 over the same period. Although these results do not show that liquidity increases more for firms with higher IR ratings, across all nominated firms DLR is still >1 for 96.81% of firms and portfolio 3 experiences a rise in LR of over 190%, again providing strong evidence that in general trading volumes increase from T to T+1 for the firms.

7.3.2.3 Regression analysis

The results of the regression analysis for UK firms, which is described in equation (7) in section 6.4.3.5, are shown in Table 7.3.2.7. As expected, for all firms both in periods T and T+1 there is a negative relationship between their equity trading volumes and beta and positive and significant relationships with their market value, indicating that stock liquidity is higher for less risky and larger sized firms. The results also show that liquidity is significantly positively related to the firms' IR rating for 'Best IR Officer' and 'Best Results Meeting' IR awards over both in the years immediately preceding and following the month of the award nominations at a 0.01 level in one-tailed tests (t >3.0 in all cases). However, the results are only significant at a 0.10 level in a one-tailed test for the firms nominated for the 'Best Annual Report' IR Award in the preceding period T (t=1.51) and are insignificant in T+1.

These findings indicate that firms with higher ratings for more effective IR via their IR officers and in meetings with fund managers and analysts, where they present their results, have higher stock liquidity, but that IR in the form of annual reports has a weaker association with stock liquidity levels. In section 7.3.3 and 7.3.4 I discuss further some reasons that may explain these findings together with a review of all of my findings on the liquidity of the US and UK firms.

This concludes my discussion of the results of the tests for any relationship between effective IR and increased stock liquidity for the UK firms. The tables of results relating to these tests are set out on the following pages.

Table 7.3.2.1.
Results of UK nominated for Best IR Officer 1999 to 2002 relative volumes (RV)

This table shows the average monthly relative volumes during period T and T+1. Relative Volume measures the traded volume of a stock as a percentage of the average traded volume of the stock of a firm in the same industry sector in the same month. The table also shows the results of a t test for differences in average RV between year T and year T+1 and also the number of companies for which the change in RV from T to T+1 (DRV) is positive or negative. DRV summarises the sign and size of the change in liquidity from before to after the company was nominated for the IR award. The table shows the number of companies in the sample where DRV is positive or negative.

Relative Volume $RV_{it} = V_{it} / (V_{mt}/N_{mt})$

Change in Relative Volume $DRV_{it} = RV_{it} - RV_{it-1}$

V_{it} = the traded volume of stock of firm i during month t

V_{mt} = traded volume of stock in firm i's industry sector during month t

N_{mt} = number of firms listed in firm i's industry sector in the FTSE All Share/S&P indices at the end of month t.

T = 12-month period preceding the month of the IR award nomination

Best IR Officer Award N = 461

Relative Volume (RV)

Portfolio	RV T	RV T+1	DRV_{it}	N
1	2.93	3.34	0.41	153
2	2.55	2.85	0.30	147
3	2.72	2.84	0.12	161
				461
2+3	2.64	2.85	0.21	

t-Test: Paired Two Sample for Means RV from T to T+1

	T	T+1
Mean	2.73	3.01
Variance	31.99	37.24
Pearson Correlation	0.90	
Hypothesized Mean Difference	0	
t Stat	2.19	

Change in Relative Volume (DRV)

Sign of DRV	No of Cases	% Cases
-ve	161	34.92%
+ve	300	65.08%
	461	

Table 7.3.2.2.
Results for UK firms nominated for Best Results Meeting 1999 to 2002 relative volumes (RV)

This table shows the average monthly relative volumes during period T and T+1. Relative Volume measures the traded volume of a stock as a percentage of the average traded volume of the stock of a firm in the same industry sector in the same month. The table also shows the results of a t test for differences in average RV between year T and year T+1 and also the number of companies for which the change in RV from T to T+1 (DRV) is positive or negative. DRV summarises the sign and size of the change in liquidity from before to after the company was nominated for the IR award. The table shows the number of companies in the sample where DRV is positive or negative.

Relative Volume $RV_{it} = V_{it} / (V_{mt}/N_{mt})$

Change in Relative Volume $DRV_{it} = RV_{it} - RV_{it-1}$

where:

V_{it} = the traded volume of stock of firm i during month t

V_{mt} = traded volume of stock in firm i's industry sector during month t

N_{mt} = number of firms listed in firm i's industry sector in the FTSE All Share/S&P indices at the end of month t.

T = 12-month period preceding the month of the IR award nomination

Best Results Meeting Award N= 412

Relative Volume (RV)

Portfolio	RV T	RV T+1	DRV_{it}	N
1	4.63	4.85	0.22	136
2	3.99	4.76	0.77	133
3	2.59	2.89	0.30	143
				412
2+3	3.60	3.86	0.26	

t-Test: Paired Two Sample for Mean RV from T to T+1

	T	T+1
Mean	3.73	4.15
Variance	181.2	211.1
Pearson Correlation	0.97	
Hypothesized Mean Difference	0	
t Stat	2.35	

Change in Relative Volumes (DRV)

Sign of DRV	No of Cases	% Cases
-ve	150	36.41%
+ve	262	63.59%
	412	

Table 7.3.2.3.
Results for UK firms nominated for Best Annual Report 1999 to 2002 relative volumes (RV)

This table shows the average monthly relative volumes during period T and T+1. Relative Volume measures the traded volume of a stock as a percentage of the average traded volume of the stock of a firm in the same industry sector in the same month. The table also shows the results of a t test for differences in average RV between year T and year T+1 and also the number of companies for which the change in RV from T to T+1 (DRV) is positive or negative. DRV summarises the sign and size of the change in liquidity from before to after the company was nominated for the IR award. The table shows the number of companies in the sample where DRV is positive or negative.

Relative Volume $RV_{it} = V_{it} / (V_{mt}/N_{mt})$

Change in Relative Volume $DRV_{it} = RV_{it} - RV_{it-1}$

V_{it} = the traded volume of stock of firm i during month t

V_{mt} = traded volume of stock in firm i's industry sector during month t

N_{mt} = number of firms listed in firm i's industry sector in the FTSE All Share/S&P indices at the end of month t.

T = 12-month period preceding the month of the IR award nomination

Best Annual Report Award N = 381

Relative Volumes (RV)

Portfolio	RV T	RV T+1	DRV_{it}	N
1	2.85	2.96	0.11	126
2	3.71	4.12	0.42	121
3	2.55	3.04	0.49	134
				381
2+3	3.13	3.58	0.45	

t-Test: Paired Two Sample for Mean RV from T to T+1

	T	T+1
Mean	3.04	3.38
Variance	37.06	46.84
Pearson Correlation	0.95	
Hypothesized Mean Difference	0	
t Stat	2.92	

Change in Relative Volumes (DRV)

Sign of DRV	No of Cases	% Cases
-ve	136	36.27%
+ve	245	63.73%
	381	

Table 7.3.2.4.
Results for all UK firms nominated for Best IR Officer 1999 to 2002 liquidity ratio (LR)

This table shows the average monthly liquidity ratios during T and T+1 by portfolio of firms. The Liquidity Ratio (LR) is a measure of 'market depth' as it measures the trading volume of a stock associated with a unit change in the stock price. The table also shows the change in the Liquidity Ratios (DLR) between year T and year T+1. This measures the change in traded volumes over time that is associated with a change stock return over the same period.

Liquidity Ratio $LR_i = \Sigma V_{it} / \Sigma |R_{it}|$

Change in liquidity ratio $DLR_i = LR_{iT+1} / LR_{iT}$

where:

V_{it} = the traded volume of stock of firm i during month t

R_{it} = the return on stock of firm I in month t

The summation is performed over both the 12-months prior to and following the month of the award (T and T+1).

T = the 12 months preceding the month of the IR award

Best IR Officer Award N = 461

Liquidity Ratio (LR)

Portfolios	LR T	LR T+1	DLR	N
1	8.99	21.51	2.39	153
2	8.59	28.50	3.32	147
3	5.84	8.71	1.49	161
				461

t-Test: Paired Two Sample for Mean LR from T to T+1

	LR T	LR T+1
Mean	7.80	19.60
Variance	721.6	1418.9
Pearson Correlation	0.19	
Hypothesized Mean Difference	0.00	
t Stat	2.16	

Change in Liquidity Ratio (DLR)

DLR	No of Cases	% of Cases
<1	8	1.74%
>1	453	98.26%
	461	

Table 7.3.2.5.

Results for all UK firms nominated for Best Results Meetings 1999 to 2002 liquidity ratio (LR)

This table shows the average monthly liquidity ratios during T and T+1 by portfolio of firms. The Liquidity Ratio (LR) is a measure of 'market depth' as it measures the trading volume of a stock associated with a unit change in the stock price. The table also shows the change in the Liquidity Ratios (DLR) between year T and year T+1. This measures the change in traded volumes over time associated with a change stock returns.

Liquidity Ratio $LR_i = \Sigma V_{it} / \Sigma |R_{it}|$

Change in liquidity ratio $DLR_i = LR_{iT+1} / LR_{iT}$

where:

V_{it} = the traded volume of stock of firm i during month t

R_{it} = the return on stock of firm I in month t

The summation is performed over both the 12-months prior to and following the month of the award (T and T+1).

T = the 12 months preceding the month of the IR award

Best Results Meeting Award N = 412

Liquidity Ratio (LR)

Portfolios	LR T	LR T+1	DLR	N
1	10.76	20.81	1.93	136
2	9.98	27.97	2.80	133
3	13.21	9.40	0.71	143
				412

t-Test: Paired Two Sample for Mean LR from T to T+1

	LR T	LR T+1
Mean	11.33	19.31
Variance	223.72	1375.50
Pearson Correlation	0.11	
Hypothesized Mean Difference	0.00	
t Stat	1.33	

Change in Liquidity Ratio (DLR)

DLR	No of Cases	% of Cases
<1	6	1.46%
>1	406	98.54%
	412	

Table 7.3.2.6.
Results for all UK firms nominated for Best Annual Report 1999 to 2002 liquidity ratio (LR)

This table shows the average monthly liquidity ratios during T and T+1 by portfolio of firms. The Liquidity Ratio (LR) is a measure of 'market depth' as it measures the trading volume of a stock associated with a unit change in the stock price. The table also shows the change in the Liquidity Ratios (DLR) between year T and year T+1. This measures the change in traded volumes over time that are associated with a change stock returns.

Liquidity Ratio $LR_i = \Sigma V_{it} / \Sigma |R_{it}|$

Change in liquidity ratio $DLR_i = LR_{iT+1} / LR_{iT}$

where:

V_{it} = the traded volume of stock of firm i during month t

R_{it} = the return on stock of firm I in month t

The summation is performed over both the 12-months prior to and following the month of the award (T and T+1).

T = the 12 months preceding the month of the IR award

Best Annual Report Award N = 381

Liquidity Ratio

Portfolios	LR T	LR T+1	DLR	N
1	10.39	7.51	0.72	126
2	17.99	14.67	0.82	121
3	6.31	12.25	1.94	134
				381

t-Test: Paired Two Sample for Mean LR T to T+1

	LR T	LR T+1
Mean	11.58	11.54
Variance	3187.24	2345.32
Pearson Correlation	0.05	
Hypothesized Mean Difference	0.00	
t Stat	-0.01	

Change in Liquidity Ratio (DLR)

DLR	No of Cases	% of Cases
<1	12	3.19%
>1	364	96.81%
	376	

Table 7.3.2.7.
Results for all UK firms nominated 1999 to 2002 equity trading volumes regression analysis

This table shows the coefficients from estimating the following regression equation for the full pooled sample of UK companies nominated in the IR Awards:

$$\mathbf{Vol}_{iT} = \mathbf{Y}_0 + \mathbf{Y}_1\mathbf{IR}_{it} + \mathbf{Y}_2\ \mathbf{log\ (MV)}_{iT} + \mathbf{Y}_3\,\boldsymbol{\beta}_{iT} + \boldsymbol{\epsilon}_{iT}$$

where:

Vol_{iT} = mean monthly traded volumes of equity for firm i in year T
IR_{it} = IR rating of firm i in year t
log $(MV)_{iT}$ = natural log of market value of equity capital of firm i at 31 March in year T
B_{iT} = equity beta of firm i in year T
ε_{iT} = error term
** indicates one-tailed statistical significance at a 0.01 level
* indicates one-tailed statistical significance at a 010 level
t = 1999 to 2002
T = 1998 to 2003 (i.e. over discrete 12-month periods from one period prior to the first IR award in 1999, to one period subsequent to the final IR awards in 2002)

Best IR Officer Award N = 416

		T		T+1	
		Coeff	**t stat**	**Coeff**	**t stat**
Intercept		-264,197	**- 3.20 ****	-401,445	**-3.21 ****
Beta	**B**	-0.04	**- 0.99**	-0.01	**-0.24**
Market Value	**MV**	0.19	**4.18 ****	0.22	**4.79 ****
IR Rating	**IR**	0.17	**3.64 ****	0.15	**3.37 ****
R^2		**0.08**		**0.08**	

Best Results Meeting Award N = 412

		T		T+1	
		Coeff	**T stat**	**Coeff**	**t stat**
Intercept		-331,143	**-3.28 ****	-431,418	**- 3.15 ****
Beta	**B**	-0.04	**-0.75**	-0.03	**- 0.64**
Market Value	**MV**	0.20	**4.03 ****	0.20	**4.20 ****
IR Rating	**IR**	0.16	**3.26 ****	0.16	**3.32 ****
R^2		**0.07**		**0.08**	

Best Annual Report Award N = 381

		T		T+1	
		Coeff	**t stat**	**Coeff**	**t stat**
Intercept		-287,305	**-3.84 ****	-291,104	**- 2.90 ****
Beta	**B**	-0.07	**-1.32 ***	-0.01	**- 0.27**
Market Value	**MV**	0.27	**5.46 ****	0.26	**5.17 ****
IR Rating	**IR**	0.08	**1.51 ***	0.06	**1.26**
R^2		**0.08**		**0.07**	

7.3.3 Addressing the research hypothesis for equity trading volumes

Although the results of the tests for any relationship between effective IR and stock liquidity measured by relative trading volume (RV) do not consistently show that the firms with the higher IR ratings have the *highest increases* in liquidity in all cases, they do show that liquidity across all the large and small US firms individually, and when combined in one sample, increases between the 12-months immediately prior to their nomination for the IR award to the 12-month period immediately following.

However, the tests based on the liquidity ratio measure (LR), which measures how volumes change in relation to a change in share price, whilst also showing that liquidity of US firms with effective IR increases after their nomination, show a *positive* relationship between number of nominations the firms receive and the increase in stock liquidity. This is important because the LR liquidity measure is perhaps a more salient measure for the IR manager, who is probably most concerned by how a rise or fall in share price may affect the volume of equity trading and vice versa. The *volume-price elasticity*, that the LR measures, is an important concept for a listed firm because if LR is high a firm should be more concerned that large disposals/acquisitions of stock will have a more significant negative/positive impact on share price compared to stocks with a lower LR. In other words, the price of a stock with a higher LR may be more *sensitive* to large buy or sell transactions.

Further, the results of the regression tests show a significant positive relationship between US firms' IR ratings and trading volumes when the US firms are combined in one sample regardless of size and for the large US firms individually but *not for the individual sample of small US firms*. These tests also find that the equity trading volumes of the smaller US firms are lower than for the large firms, which is consistent with the findings of existing research and some recent industry studies claiming that the stock of smaller firms are 'trapped' in a less liquid end of the equity markets, i.e. that liquidity is negatively related to firm size. These findings that suggest that firm size is an important factor in any relationship between effective IR

and stock liquidity are discussed further below in sections 7.3.3 and 7.3.4 and also in my review of all of my findings in chapter 8.

Meanwhile, the UK firms nominated in all three IR award categories also show significant increases in liquidity in the period immediately following their nominations compared to 12-months immediately prior, by all of the measures of liquidity I employ. Whilst the results for the UK firms using the relative volume measure (RV) and the liquidity ratio (LR) show *increased liquidity over time*, unexpectedly there again no obvious relationship between the size of their IR ratings and liquidity. However, the regression analysis results show that liquidity is *significantly positively related to* the number of the firms' IR award nominations, although only for the firms nominated for *Best IR Officer* and *Best Results Meeting* and not for the firms with the *Best Annual Report* communications (although the coefficients for the latter are all positive). As noted above, these latter findings suggests that effective IR in the more informal and frequent forms, in person via the IR officer and in company meetings, may have a greater positive impact on liquidity compared to the effect of effective IR in more formal communications such as in annual reports, indicating that the form and frequency of corporate IR communications are important. This issue is discussed more fully in chapter 8.

7.2.4 Theory

As I explain in section 4.1, that effective IR should be associated with increased volumes of equity trading is consistent with the relationship predicted information risk and agency theories. These theories predict that an enhanced information disclosure policy will reduce the level of information asymmetry between inside managers and external shareholders, leading to a reduction in perceived risks associated with a stock and in reduced agency costs for investors. The theories explain that by alleviating any agency problems and reducing the level of perceived risk caused by information asymmetry, effective IR will stimulate equity trading volumes and enhance stock liquidity.

7.2.5 Conclusion on equity trading volumes/liquidity

The results of my tests for any relationship between levels of cross-sectional liquidity of the firms at any point in time and the effectiveness of the firms' IR ratings are mixed and therefore somewhat inconclusive. However, the results of the tests described above in section 7.3.1 and 7.3.2, using both of the measures that I use to gauge changes in liquidity levels (RV and LR) provide compelling evidence that the firms with effective IR experience rising stock liquidity in the period immediately following their nomination in the IR awards and that this increase in liquidity is statistically significant.

My findings therefore support the findings in prior research that also shows that "*A corporation can affect liquidity ....by the amount and quality of the information it releases to investors*" (Amihud and Mendelson, 1986) and allows a rejection of the null hypothesis *H03: there is no significant relationship between effective IR and* ***future increased trading volumes of equity.***

This concludes the section on equity trading volumes test results, which are discussed more fully in chapter 8.

7.4. Cost of Equity Capital

Introduction

In this section I describe the results of the empirical tests described in section 6.5 to test the null hypotheses to test for any relationship between the firms' IR performance and their cost of equity capital:

H04: There is no significant relationship between effective IR and ***future expected cost of equity capital.***

Section 7.4.1 describes the test results for the US firms and section 7.4.2 the results for the UK firms. In section 7.4.3 I discuss how these results relate to hypothesis *H04* and in section 7.4.4 how my findings compare to those predicted by relevant theory. Section 7.4.5 concludes my findings relating to the firms' cost of equity capital

7.4.1. US firms' cost of equity capital

The results are shown in table 7.4.1.1 to 7.4.1.5, following a description of the test results below.

7.4.1.1 Descriptive statistics

Table 7.4.1.1 shows that, across the US large firms the mean cost of capital falls by 4.3%, from 11.4% in T-2 to 6.5% in T+2. Meanwhile, the second panel in table 7.4.1.1 shows that the average cost of capital for smaller US firms is slightly higher than for the large US firms in almost all these periods, indicating that smaller firms may generally face a higher cost of equity capital. However, the average cost of capital across small firms also falls steadily and consistently over the consecutive periods T-2 to T+2 from 12.3% to 8.3% (by 4.0% in total). Finally, when all firms are combined into one sample of large and small firms, the average cost of capital for the combined sample falls consistently over periods T-2 to T+2 from 12.0% to 7.7%. These results provide preliminary support for the proposition that effective IR is associated with a reduced cost of equity, although any such conclusion depends inter alia upon any weaknesses in my methodology for estimating the firms' cost of equity and also may merely be a result of a more general fall in the cost of equity that is unrelated to IR, which I discuss further below in section 7.4.3.

7.4.1.2 Results for cost of capital by portfolio

The results are shown in Table 7.4.1.2. to 7.4.1.4.

US large firms

For each portfolio of large firms, whether formed by IR rating or by equal numbers of firms, the average estimated cost of capital falls over each consecutive period T-2 to T+1, and then rises slightly in period T+2. The average estimate for constituent firms in portfolio 1 (based on the percentage rank of IR rating and containing 302 firms) falls from 11.3% to 5.2% in total over periods T-2 to T+1, rising in T+2 to 6.5%. The average for portfolio 1 formed by equal number of firms (353 firms) falls from 12.6% to 5.7%, rising to 6.6% in T+2. Also, in most of these periods, firms in portfolio 1 have the lowest average cost of capital and particularly so in period T+1, the 12-months *immediately following* the month of award nomination and also in period T+2. The comparison of the average for portfolio 1 and for portfolio 10 shows that in all periods T to T+2 inclusive, the average cost of capital estimate is significantly lower for the firms in portfolio 1. Further, in periods T to T+2 the average of the top 50% of firms (portfolios 1 to 5 versus portfolios 6 to 10) is lower by 0.8% in T, in period T+1 by 1.3% and in period T+2 by 0.9%. These results together indicate both that effective IR is associated with a reduction in the cost of equity capital and also that firms that have more effective IR have a lower cost of capital. These findings are discussed further below in section 7.4.3 and 7.4.4.

US small firms

Table 7.4.1.3 shows that, by both methods of portfolio formation, the average estimate for the small firms in both portfolios 1 and 2 also falls consistently over the time periods T-2 to T+2. This is also the case for portfolio 3 (684 out of 2,054 firms), until period T+1, although the average estimate rises in T+2 from 8.3% to 9.6% but only when the portfolios are formed by equal numbers and not when based on percentage rank of their IR ratings. However, overall there is not strong evidence that portfolio 1 firms have significantly lower average cost of capital compared to the other firms, although in none of the periods do portfolio 1 firms have the *highest* average estimate. Although in all periods, except for period T, the top 50% firms (portfolios 1 to 5) have a lower average cost of capital than the bottom 50%

(portfolios 6 to 10) but during period T the difference is only of 0.7%. These results indicate that effective IR for small firms is also associated with a reduced cost of capital over time, but there is weaker evidence of any relationship between their IR ratings and a significantly lower cost of capital compared to that shown for the large firms. I discuss any reason for these findings further in section 7.4.3 and 7.4.4 below.

US large and small firms

The average cost of capital estimate shown in table 7.4.1.4 for the firms in each of the 3 combined portfolios, formed by both methods, falls consistently and steadily over the consecutive periods T-2 to T+2. Portfolio 1 firms have the lowest average of the three groups of firms in all periods except for T-2 for the group containing 1,037 firms. However, across all periods the average cost of capital for portfolio 1 falls from 11.4% to 7.2% for the highest rated 687 firms and from 11.9% to 6.9% for the top 1,037 firms. Portfolio 2 firms show a similar range of results over this period, falling from 12.9% in T-2 to 7.5% in T+2 (11.3% to 7.5% for the portfolios of equal numbers) and similar results are found for firms in portfolios 3. Although portfolio 2 firms do not have a lower average cost of capital than firms in portfolio 3 in all periods, the difference is only approximately 1% in each period. The analysis by 10 portfolios of equal numbers of firms shows that for almost all of the 10 groups of 311 firms, the average falls consistently and steadily over time. In summary, I find a negative relationship between effective IR and the size of the cost of equity capital over time for the firms that I test, which suggests that this may also hold for firms more generally. I discuss some reasons for my findings and any implications they imply below in sections 7.4.3 and 7.4.4 and also in my review of all my findings in chapter 8.

7.4.1.3 Regression analysis

So far my tests on the firms' cost of equity test purely for any direct relationships between the firms' IR ratings and their cost of equity on both an inter-temporal and on a cross-sectional basis in discrete periods. However, the regression analysis that I also use is equation (9), described above in section 6.5, which additionally controls for firm size (MV) and risk (equity beta β) and also provides a measure of statistical significance of any such relationships. Equation (9) is set out again as follows:

$$r_{iT} = \gamma_0 + \gamma_1 IR_{it} + \gamma_2 \log (MV)_{iT} + \gamma_3 \beta_{iT} + \varepsilon_{iT} \quad (9)$$

The results of these regression analyses for US firms are shown in table 7.4.1.5, following this description of the regression test results. Firstly, theory and prior literature would suggest that larger and less risky firms have a lower cost of equity capital. The results in table 7.4.1.5 for the combined sample of large and small firms in fact do show, in all cases and during all periods, a negative relationship between the firms' market value and cost of equity (significant at a 0.01 level in three of these periods). The relationships between cost of equity and equity beta are expected to be positive and, although they are unexpectedly mixed in sign, they are not significant at a 1% level in any period. I review these findings further in chapter 8 and the remainder of this section relates to the regression results for the firms' IR ratings (the variable IR in equation (9)).

US large firms

The first panel in table 7.4.1.5 shows the results for the large US firms and shows that the sign of the relationship between IR rating and cost of capital changes across the periods. Notably, in T-2 there is a significant *positive* relationship between the large firms' IR ratings and cost of equity (t= 1.59) and also in T-1 (at a 0.01 level, t= 2.47). This means that the firms that receive the most nominations at the end of period T had a higher cost of capital in two of the three prior years compared to those subsequently nominated less often. The coefficient indicates that in period T-1 this is by 10.9% higher across the whole sample of 1,059 large firms. There are not any obvious reasons to explain these results, but they do serve to contrast with the results in the 12-months immediately preceding the IR awards (T) and the two following periods T+1 and T+2. In period T there is now a negative relationship between IR rating and the cost of capital (significant at a 0.10 level, t= -1.61) and in T+1 there is also a significant *negative* relationship (t = - 1.97) at a 0.025 level. In T the most nominated firms have a cost of capital 2.7% lower than the least nominated and in T+1 this differential in 4.0%, although the results in period T+2 are not significant. Overall, these findings indicate that more effective IR by large firms is associated with a subsequently reduced cost of equity.

US small firms

Although the results for small firms in the second panel of table 7.4.1.5 show a negative relationship between IR rating and cost of capital in T-1 and T, the coefficients are not significant. However, in period T there is a negative coefficient (significant at a 0.05 one-tailed level), indicating that the firms with most nominations at the end of T had 2.3% lower cost of equity compared to the other firms (t= -1.87). However, in the periods following the IR award nomination month this differential *increases* and the firms with most nominations have a 3% lower cost of equity in T+1 and by 8.7% in T+2 (t= -2.13 and -3.27, respectively). This again suggests that effective IR is associated with a subsequent reduction in firms' cost of equity.

US large and small firms

The final panel in table 7.4.1.5 shows the regression results for the full sample of US firms nominated for effective IR. There are significant results showing a positive relationship between the firms' IR ratings and their subsequent cost of equity in periods T-2 and T-1, (at a 0.10 one-tailed significance level (t= 1.62) in T-2, and in period T-1 at a 0.01 level (t= 2.63)). Again means that the firms that subsequently receive more award nominations in period T previously have significantly higher cost of equity compared to the other nominated firms. However, during the periods immediately preceding and following the nominations the sign of this relationship changes to a *negative* one and, although the coefficients are not statistically significant in T and T+2 (t = -1.24 and -1.10, respectively), they are significant at a 0.10 one-tailed level in T+1 (t= -1.36).

These findings, prima facie, suggest that more effective IR is associated with a subsequent fall in the cost of equity and further discussion, support for, and any reasons for this I present below in sections 7.4.3 and 7.4.4 and also in my overall review in chapter 8.

7.4.1.4 Regression analysis by portfolio

Again, a further analysis was performed which replicated the regression test above for the firms in three pooled portfolios following the method described in section 6.1. However, because these tests do not produce any further significant results or

relationships between effective IR and the cost of capital tests that are not presented or further discussed.

This concludes my discussion of the tests of the cost of equity of the US firms with effective IR. The tables showing the test results described above are set out on the following pages and all of the findings described above are discussed further below in section 7.4.3 to 7.4.5, following my description of the test results for the UK firms in the following in section 7.4.2.

Table 7.4.1.1.
Results for US firms nominated for Best Overall IR 2000 to 2002 descriptive statistics of estimated cost of equity capital
This table show the range, minimum, maximum, mean, standard deviation and percentile averages of the cost of equity capital estimates in period T-2 to T+2 of the US firms nominated for Best Overall IR 2000 to 2002 pooled across these years.

Large Firms N = 1,059

Period	Range	Min	Max	Mean	Std. Deviation	Percentiles 25%	50%	75%
T-2	98.17%	0.00%	98.17%	11.44%	15.98%	2.48%	7.96%	11.80%
T-1	99.91%	0.00%	99.91%	11.53%	15.75%	2.56%	7.71%	13.66%
T	78.04%	0.00%	78.04%	8.27%	7.52%	3.12%	7.19%	11.33%
T+1	49.14%	0.00%	49.14%	6.33%	6.16%	2.01%	5.00%	9.02%
T+2	90.20%	0.00%	90.20%	6.50%	8.15%	1.40%	4.32%	9.17%
Average				**8.81%**				

Small Firms N = 2,054

Period	Range	Min	Max	Mean	Std. Deviation	Percentiles 25%	50%	75%
T-2	97.84%	0.00%	97.84%	12.29%	13.78%	3.38%	8.31%	15.35%
T-1	99.80%	0.00%	99.80%	10.84%	12.38%	3.70%	8.31%	12.85%
T	97.08%	0.00%	97.08%	9.83%	10.46%	2.87%	7.74%	12.08%
T+1	89.64%	0.00%	89.64%	8.67%	10.64%	2.01%	6.01%	11.81%
T+2	99.99%	0.00%	99.99%	8.33%	10.56%	2.02%	6.03%	10.98%
Average				**9.99%**				

Large and Small Firms N = 3,113

Period	Range	Min	Max	Mean	Std. Deviation	Percentiles 25%	50%	75%
T-2	98.17%	0.00%	98.17%	12.02%	14.57%	2.96%	7.75%	14.16%
T-1	99.91%	0.00%	99.91%	11.11%	13.62%	3.16%	7.57%	13.09%
T	97.08%	0.00%	97.08%	9.21%	9.58%	2.95%	7.55%	11.91%
T+1	89.64%	0.00%	89.64%	7.94%	9.43%	2.01%	5.28%	10.36%
T+2	99.99%	0.00%	99.99%	7.64%	9.84%	1.79%	5.36%	10.31%
Average				**9.58%**				

Table 7.4.1.2.
Results for large US firms nominated for Best Overall IR 2000 to 2002 estimated cost of equity capital by portfolio

This table shows the cost of equity capital estimates for the firms pooled across the IR Awards 2000, 2001 and 2002 for the two 12 month periods T and T+1.
The pooled samples of all companies nominated in the IR award in 2000, 2001 and 2002 are divided into portfolio groups based on their IR rating, firstly into three portfolios (portfolio number 1 is the highest rated), then into 10 portfolios.
The Cost of Equity Capital is estimated from 'base years' two year prior to and two years following the 12 month period in which the company is nominated for an IR Award, by solving the following equation:

$$Pt = \sum_{\tau=1}^{4}(1+ r_{i\,t})^{-\tau} E_t(d_{t+\tau}) + (1+r)^{-4} E_4[P_4]$$

where:
$r_{i\,t}$ = estimated expected cost of equity capital for firm i at time t, P_t = share price of firm i at time t, P_4 is the forecasted share price four periods ahead, E_t = the expectations operator, t = 0 is at 01/04/1997, 1998, 1999, 2000, 2001, t = 01/04/2000, 2001, 2002, 2003, 2004.

Large Firms N = 1,059

Portfolio Number	T-2	T-1	T	T+1	T+2	N	% of IR rating
1	11.34%	11.58%	7.76%	5.20%	6.45%	302	100 - 66.7
2	12.52%	11.51%	8.16%	6.61%	5.79%	246	66.6 - 33.4
3	10.46%	11.48%	8.90%	7.17%	7.25%	511	< 33.3
Average	**11.44%**	**11.53%**	**8.27%**	**6.33%**	**6.50%**	1,059	
1	12.60%	12.03%	8.01%	5.68%	6.55%	353	
2	9.45%	10.08%	7.42%	5.74%	5.50%	353	
3	11.52%	12.44%	9.77%	8.01%	7.99%	353	
Average	**11.44%**	**11.53%**	**8.27%**	**6.33%**	**6.50%**	1,059	
1	10.58%	11.98%	7.24%	4.15%	5.18%	106	
2	12.51%	11.70%	8.19%	5.39%	7.40%	106	
3	11.82%	11.50%	7.63%	6.64%	7.02%	106	
4	12.73%	11.77%	9.30%	6.63%	5.86%	106	
5	11.81%	11.31%	7.67%	6.32%	5.66%	106	
6	9.25%	9.06%	6.53%	5.49%	5.82%	106	
7	7.07%	8.81%	7.26%	4.83%	5.69%	106	
8	20.32%	16.83%	9.83%	10.07%	9.59%	106	
9	7.00%	10.10%	8.86%	7.32%	6.74%	106	
10	8.77%	12.13%	11.55%	7.95%	7.86%	105	
Average	**11.44%**	**11.53%**	**8.27%**	**6.33%**	**6.50%**	1,059	
1	10.58%	11.98%	7.24%	4.15%	5.18%	106	
10	8.77%	12.13%	11.55%	7.95%	7.86%	105	
1-5	11.89%	11.65%	8.01%	5.83%	6.22%	530	
6-10	10.48%	11.39%	8.80%	7.13%	7.14%	529	
						1,059	

Table 7.4.1.3.
Results for small US firms nominated for Best Overall IR 2000 to 2002 estimated cost of equity capital by portfolio

This table shows the cost of equity capital estimates for the firms pooled across the IR Awards 2000, 2001 and 2002 for the two 12 month periods T and T+1.
The pooled samples of all companies nominated in the IR award in 2000, 2001 and 2002 are divided into portfolio groups based on their IR rating, firstly into three portfolios (portfolio number 1 is the highest rated), then into 10 portfolios.
The Cost of Equity Capital is estimated from 'base years' two year prior to and two years following the 12 month period in which the company is nominated for an IR Award, by solving the following equation:

$$P_t = \sum_{\tau=1}^{4}(1+r_{i\,t})^{-\tau} E_t(d_{t+\tau}) + (1+r)^{-4} E_4[P_4]$$

$r_{i\,r}$ = estimated expected cost of equity capital for firm i at time t, P_t = share price of firm i at time t, P_4 = forecasted share price four periods ahead, E_t = the expectations operator, and, t = 01/04/1997, 1998, 1999, 2000, 2001, t = 4 is 01/04/2000, 2001, 2002, 2003, 2004.

Small Firms N = 2,054

Portfolio Number	T-2	T-1	T+1	T	T+2	N	% of IR rating
1	11.51%	10.26%	9.80%	8.53%	7.86%	385	100 – 66.7
2	13.13%	11.22%	10.36%	8.79%	8.50%	389	66.6 - 33.4
3	12.24%	11.04%	9.33%	8.69%	8.62%	1,280	< 33.3
Average	**12.29%**	**10.84%**	**9.83%**	**8.67%**	**8.33%**	**2,054**	
1	12.11%	10.73%	10.35%	8.72%	6.66%	685	
2	11.95%	11.18%	10.47%	8.96%	8.74%	685	
3	12.76%	10.67%	8.71%	8.31%	9.56%	684	
	12.29%	**10.84%**	**9.83%**	**8.67%**	**8.33%**	**2,054**	
1	10.61%	9.36%	10.53%	8.70%	5.48%	205	
2	12.80%	10.67%	9.62%	8.11%	6.33%	205	
3	11.69%	11.42%	10.85%	8.99%	6.68%	205	
4	14.09%	11.17%	9.67%	8.67%	8.13%	205	
5	10.83%	10.81%	10.18%	8.52%	7.12%	205	
6	12.53%	11.02%	12.12%	10.25%	7.08%	205	
7	11.30%	13.45%	9.77%	9.04%	9.36%	205	
8	10.77%	12.06%	9.41%	8.65%	10.24%	205	
9	14.11%	9.17%	6.58%	7.54%	11.55%	205	
10	13.95%	9.48%	9.62%	8.09%	11.22%	209	
Average	**12.27%**	**10.84%**	**9.83%**	**8.67%**	**8.33%**	**2,054**	
1	10.61%	9.36%	10.53%	8.70%	8.13%	205	
10	13.95%	9.48%	9.62%	8.09%	11.22%	209	
1-5	12.00%	10.69%	10.17%	8.60%	7.92%	1025	
6-10	12.53%	11.04%	9.50%	8.71%	11.01%	1029	
						2,054	

Table 7.4.1.4.
Results for large and small US firms nominated for Best Overall IR 2000 to 2002 estimated cost of equity capital by portfolio

This table shows the cost of equity capital estimates for the firms pooled across the IR Awards 2000, 2001 and 2002 for the two 12 month periods T and T+1.
The pooled samples of all companies nominated in the IR award in 2000, 2001 and 2002 are divided into portfolio groups based on their IR rating, firstly into three portfolios (portfolio number 1 is the highest rated), then into 10 portfolios.
The Cost of Equity Capital is estimated from 'base years' two year prior to and two years following the 12 month period in which the company is nominated for an IR Award, by solving the following equation:

$$Pt = \sum_{\tau=1}^{4}(1+ r_{i\,t})^{-\tau} E_t(d_{t+\tau}) + (1+r)^{-4} E_4[P_4]$$

$r_{i\,r}$ = estimated expected cost of equity capital for firm i at time t , P_t = share price of firm i at time t, P_4 = forecasted share price four periods ahead, E_t = the expectations operator, t = 0 is at 01/04/1997, 1998, 1999, 2000, 2001, t = 4 is 01/04/2000, 2001, 2002, 2003, 2004.

Large and Small Firms N = 3,113

Portfolio Number	T-2	T-1	T	T+1	T+2	N	% of IR rating
1	11.44%	10.84%	8.90%	7.63%	7.24%	687	100 - 66.7
2	12.89%	11.33%	9.51%	7.95%	7.45%	634	66.6 - 33.4
3	11.73%	11.17%	9.20%	8.25%	8.23%	1,792	< 33.3
Average	**12.02%**	**11.11%**	**9.21%**	**7.94%**	**7.64%**	**3,113**	
1	11.90%	10.95%	9.08%	7.26%	6.85%	1,037	
2	11.31%	11.34%	9.45%	7.80%	7.45%	1,037	
3	12.85%	11.04%	9.11%	8.76%	8.63%	1,039	
	12.02%	**11.11%**	**9.21%**	**7.94%**	**7.64%**	**3,113**	
1	11.88%	11.42%	9.11%	6.69%	7.29%	311	
2	11.68%	10.90%	9.04%	8.29%	7.06%	311	
3	11.61%	10.53%	8.18%	7.10%	6.22%	311	
4	12.73%	11.63%	10.90%	9.03%	7.70%	311	
5	10.60%	9.12%	7.41%	6.21%	7.63%	311	
6	11.53%	13.60%	10.35%	8.42%	7.88%	311	
7	12.53%	10.37%	10.45%	8.60%	6.04%	311	
8	11.91%	12.88%	11.10%	8.98%	6.75%	311	
9	11.37%	10.73%	8.46%	8.03%	10.54%	311	
10	14.41%	9.92%	7.13%	8.09%	9.28%	314	
Average	**12.02%**	**11.11%**	**9.21%**	**7.94%**	**7.64%**	**3,113**	
1	11.88%	11.42%	9.11%	6.69%	7.70%	311	
10	14.41%	9.92%	7.13%	8.09%	9.28%	314	
1-5	11.70%	10.72%	8.93%	7.46%	7.31%	1,555	
6-10	12.35%	11.50%	9.50%	8.42%	8.86%	1,558	
						3,113	

Table 7.4.1.5.
Results for all US firms nominated for Best Overall IR 2000 to 2002 cost of equity capital regression analysis

This table shows the coefficients from estimating the following regression equation for the full pooled sample of US firms nominated in the IR Awards:

$$r_{iT} = Y_0 + Y_1 IR_{it} + Y_2 \log (MV)_{iT} + Y_3 \beta_{iT} + \varepsilon_{iT}$$

r iT = estimate of cost of equity capital for firm i in year T
IR_{it} = IR rating of firm i in year t
log (MV) = natural log of the market value of equity capital of firm i at 31 March in year T
β_{iT} = equity beta of firm i in year T
ε_{iT} = error term
T= 1998 to 2004
t = 2000 to 2002
* indicates one-tailed statistical significance at a 0.10 level
** indicates one-tailed statistical significance at a 0.05 level
*** indicates one-tailed statistical significance at a 0.01 level

Large Firms N = 1,059

		T-2		T-1		T		T+1		T+2	
		Y_0	t	Y_0	t	Y_0	t	Y_0	t	Y_0	t
Intercept		0.061	**2.362*** **	0.100	**3.080*** **	0.081	**5.137*** **	0.055	**7.005*** **	0.090	**2.146**
Beta	**B**	0.064	**2.087** **	0.015	**0.477**	0.006	**0.204**	0.051	**1.676** **	0.048	**1.565**
Market Value	**MV**	- 0.085	**- 1.941** **	- 0.106	**-2.417*** **	- 0.004	**- 0.100**	- 0.079	**-1.802** **	- 0.021	**- 0.480**
IR Rating	**IR**	0.070	**1.589***	0.109	**2.471*** **	- 0.027	**-1.607***	-0.040	**-1.967** **	- 0.011	**- 0.250**
R^2		**0.047**		**0.042**		**-0.022**		**- 0.012**		**- 0.040**	

Table 7.4.1.5 continued

Small Firms N = 2,054

		T-2		T-1		T		T+1		T+2	
		Y_0	t	Y_0	t	Y_0	t	Y_0	t	Y_0	t
Intercept		0.170	7.901***	0.136	7.042***	0.112	6.923***	0.098	5.888***	0.093	5.701***
Beta	B	- 0.046	- 2.094**	- 0.029	- 1.319*	-0.036	-1.624*	-0.023	-1.028	-0.006	-0.274
Market Value	MV	- 0.057	- 2.131**	- 0.007	- 0.261	-0.133	-4.982***	-0.041	-1.541*	-0.161	-6.039***
IR Rating	IR	0.024	0.882	- 0.009	- 0.330	-0.023	-1.867**	-0.030	-2.127**	-0.087	-3.269***
R^2		0.027		- 0.040		- 0.015		- 0.032		- 0.016	

Large and Small Firms N = 3,113

		T-2		T-1		T		T+1		T+2	
		Y_0	t	Y_0	t	Y_0	t	Y_0	t	Y_0	t
Intercept	Y_0	0.113	7.006***	0.119	7.144***	0.111	9.348***	0.067	7.330***	0.069	5.527***
Beta	B	0.007	0.374	-0.010	- 0.580	- 0.029	- 1.599*	0.031	1.752**	0.015	0.841
Market Value	MV	- 0.063	-2.452***	-0.061	- 2.368***	- 0.028	- 1.079	- 0.079	-3.061***	-0.044	-1.707**
IR Rating	IR	0.041	1.618*	0.067	2.628***	- 0.006	-1.238	- 0.009	-1.357*	-0.002	-1.091
R^2		0.010		0.015		- 0.040		- 0.057		- 0.010	

7.4.2. UK Firms' Cost of Equity Capital

The results are shown in table 7.4.2.1 to 7.4.2.3.

7.4.2.1 Descriptive statistics

The descriptive statistics are shown in Table 7.4.2.1. The magnitude of the cost of capital for the UK firms is approximately similar to those calculated for the US firms. Indeed, due to international trading arbitrage, there are no theoretical or practical reasons to expect that the cost of capital should differ markedly between the two markets.

Best IR Officer Award

The average cost of equity across firms nominated for this IR awards in all years from 1999 to 2002 is 12.7% in T-2 and is 11.3% in T+2. However, over the three consecutive periods immediately surrounding the month in which they are nominated their average cost of equity falls from 14.79% in T-1 to 8.0% in T+1.

Best Results Meeting

The second panel of table 7.4.2.1 shows that in most periods I test the 412 firms nominated in this IR category have a higher cost of capital compared to the firms nominated for 'Best IR Officer'. However, their cost of capital also falls over this period of time, from an average of 14.9% in period T-2 to 9.8% in T+2 and likewise it falls consistently over each consecutive period in-between.

Best Annual Report

The final panel in table 7.4.2.1 shows that, in the case of the firms nominated for 'Best Annual Report, average cost of capital *increases*, from 12.4% in period T-2 to 14.8% in T-1, falls to 11.1% in T and to 8.4% in T+1, but it then rises again to 12.1% in T+2. Therefore, even though the level of cost of capital varies more for these firms, it also shows a steady decline over the three periods immediately surrounding the month of their award nominations.

In summary and, as I point out in section 7.4.1.1 for the US firms, these findings provide preliminary support for the proposition that effective IR is associated with a reduced cost of equity. However, any such conclusion for UK firms also depends upon any weaknesses in my methodology for calculating the cost of capital and also may merely be a result of a more general fall in the cost of equity that is unrelated to

IR and I discuss these issues in relation to both the US and UK firms below in section 7.4.3.

7.4.2.2 Results for cost of capital by portfolio

The results for the portfolios of firms are shown in Table 7.4.2.2, following a review of the salient findings.

Best IR Officer

For all three portfolios of firms, the average cost of capital across the firms in each portfolio falls consistently over the periods T-1 to T+1, which are the three 12-month periods immediately surrounding the month of the award nominations. In the periods T-1 to T the firms in portfolio 1 have the lowest average cost of capital compared to the other firms nominated in this award. In period T cost of capital for portfolio 1 is 10.4%, falling to 7.2% in T+1 and in both of these periods the cost of equity of the other two portfolios is over 1% higher.

Best Results Meeting

The average cost of equity of portfolios 1 and 2 of firms nominated in this IR award category also falls over the periods T-2 to T+1 and this is also the case for the firms in portfolio 3 (143 firms out of 412) until period T but it then rises from 15.4% to 17.2% in T+1, although in T+2 it falls again to 14.5%, which is also the lowest results in any of the years T-2 to T+2 for this group of firms. Also the firms in portfolio 1 have the lowest average estimate in all years T-2 to T+1, although in T+2 the firms in portfolio 2 have a lower average, at 5.0% compared to 9.9%, but the average for portfolio 1 still remains lower than the average cost of capital across all firms in this period (9.78%).

Best Annual Report

Across firms nominated in this award category there is again a general decline in the average cost of capita and once again this is seen especially over the three periods surrounding the month of award nomination (T-1 to T+1). However, unexpectedly in almost all of these periods the firms in portfolio 1 have above the average cost of capital across all firms nominated for this award. Therefore, although the average for portfolio1 firms falls over the periods T-1 to T+1, from 16.35% to 8.21%, there is no evidence that the size of the annual report IR rating within periods is related to the cost of capital.

7.4.2.3 Regression Analysis Results

The results of the regression analysis for UK firms are shown in Table 7.4.2.3. Firstly, theory and prior research indicate that there is a negative/positive relationship between firm size/risk and cost of equity. Table 7.4.2.3 shows that in each of the periods I test and for all firms, although not significant in all cases, the signs of the regression coefficients reflect support these predicted relationships.

Best IR Officer

The only significant result is in period T+1, the 12-months immediately following the period of firm nominations for the IR awards, when there is a significant negative relationship between IR rating and cost of capital (t = -2.50) and the highest rated firms have a lower average cost of capital by 11.7%. There are also negative coefficients in periods T-1, T and T-2, but these are not significant.

Best Results Meeting

Unexpectedly, because this is contrary to theory, there are highly significant positive relationships between IR rating and cost of capital in all periods T-1 to T+2 (t= 6.30 in T+1). This means that the apparent negative relationship between IR rating and the cost of capital for these firms that was shown in the analysis of averages by portfolio, described in section 7.4.2.2 above, is reversed once the analysis controls for market value and risk (equity beta) and that the firms with a higher rating in this category have a *higher* cost of capital. The implications of this finding are further discussed below.

Best Annual Report

None of the statistical results are significant for the firms nominated in this IR award category and this finding is also further discussed below.

This concludes my description of the test results relating to the cost of equity of the UK firms. The tables of the results on the UK firms are set out on the following pages.

Table 7.4.2.1.
Results for UK firms nominated 1999 to 2002 descriptive statistics of estimated cost of equity capital

This table show the range, minimum, maximum, mean, standard deviation and percentile averages of the cost of equity capital estimates in period T-2 to T+2 of the all the of the UK firms nominated for the IR Awards 1999 to 2002 pooled across these years.

Best IR Officer Award N = 461

Period	Range	Min	Max	Mean	Std. Deviation	Percentiles 25%	50%	75%
T-2	77.57%	0.00%	77.57%	12.71%	10.83%	5.38%	10.52%	15.70%
T-1	83.91%	0.00%	83.91%	14.79%	12.37%	7.01%	12.12%	19.07%
T	74.55%	0.01%	74.56%	10.91%	8.14%	4.63%	10.11%	15.30%
T+1	62.12%	0.00%	62.12%	7.98%	9.20%	2.06%	4.43%	11.07%
T+2	99.83%	0.00%	99.83%	11.29%	9.55%	3.18%	11.89%	14.04%
Average				**11.54%**				

Best Results Meeting Award N = 412

Period	Range	Min	Max	Mean	Std. Deviation	Percentiles 25%	50%	75%
T-2	85.75%	0.00%	85.75%	14.87%	12.79%	6.63%	11.79%	18.48%
T-1	85.75%	0.00%	85.75%	14.43%	11.88%	7.01%	11.40%	17.87%
T	72.31%	0.16%	72.47%	12.58%	9.98%	5.45%	11.17%	16.97%
T+1	89.34%	0.00%	89.34%	10.93%	12.22%	2.83%	8.17%	14.91%
T+2	77.70%	0.00%	77.70%	9.78%	8.31%	2.94%	10.34%	13.24%
Average				**12.52%**				

Best Annual Report Award N = 381

Period	Range	Min	Max	Mean	Std. Deviation	Percentiles 25%	50%	75%
T-2	97.32%	0.00%	97.32%	12.42%	10.66%	5.39%	10.47%	15.23%
T-1	89.53%	0.01%	89.54%	14.81%	12.40%	7.14%	12.30%	18.56%
T	74.55%	0.01%	74.56%	11.14%	8.76%	4.77%	10.10%	15.31%
T+1	93.61%	0.01%	93.62%	8.39%	10.11%	2.11%	4.45%	11.04%
T+2	99.82%	0.01%	99.83%	12.12%	11.06%	3.84%	12.13%	14.34%
Average				**11.78%**				

Table 7.4.2.2.
Results for large UK firms nominated 1999 to 2002 estimated cost of equity capital by portfolio

This table shows the average estimates for portfolios of UK firms nominated in the IR Awards 1999, 2000, 2001 and 2002 over the periods T-2 to T+2.
The pooled samples of all companies nominated in the IR award in 1999 to 2002 are divided into portfolio groups based on their within-year IR rating and the portfolios are then pooled across years.
The Cost of Equity Capital is estimated from 'base years' two year prior to and two years following the 12 month period in which the company is nominated for an IR Award, by solving the following equation:

$$P_t = \sum_{\tau=1}^{4} (1+r_i)^{-\tau} E_t(d_{t+\tau}) + (1+r)^{-4} E_4[P_4]$$

r_i = estimated expected cost of equity capital for firm i at time t
P_t = share price of firm i at time t
P_4 = forecasted share price four periods ahead
E_t = the expectations operator, and;
t = 0 is at 01/04/1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004

Best IR Officer Award N = 461

Portfolios	T-2	T-1	T	T+1	T+2	N
1	13.13%	13.85%	10.35%	7.16%	10.96%	152
2	12.04%	14.77%	10.76%	8.05%	11.07%	148
3	12.96%	15.75%	11.61%	8.72%	11.85%	161
Average	12.71%	14.79%	10.91%	7.98%	11.29%	461
Difference 3 and 1	-0.17%	1.90%	1.26%	1.56%	0.89%	

Best Results Meeting Award N = 412

Portfolios	T-2	T-1	T	T+1	T+2	N
1	11.29%	11.61%	10.27%	6.92%	9.85%	136
2	18.01%	15.74%	12.06%	8.67%	4.99%	133
3	15.30%	15.93%	15.40%	17.20%	14.50%	143
Average	14.87%	14.43%	12.58%	10.93%	9.78%	412
Difference 3 and 1	4.01%	4.32%	5.13%	10.28%	4.64%	

Best Annual Report Award N = 381

Portfolio	T-2	T-1	T	T+1	T+2	N
1	13.60%	16.35%	11.71%	8.21%	12.12%	124
2	11.83%	14.96%	11.25%	8.15%	11.56%	115
3	11.84%	13.13%	10.45%	8.82%	12.67%	137
Average	12.42%	14.81%	11.14%	8.39%	12.12%	376
Difference 3 and 1	-1.76%	-3.22%	-1.26%	0.61%	0.55%	

Table 7.4.2.3.
Results for all UK firms nominated 1999 to 2002 cost of equity capital regression analysis

This table shows the coefficients from estimating the following regression equation for the full pooled sample of UK companies nominated in the IR Awards:

$r_{iT} = Y_0 + Y_1 IR_{it} + Y_2 \log (MV)_{iT} + Y_3 \beta_{iT} + \varepsilon_{iT}$

r_{iT} = estimate of cost of equity capital for firm i in year T
IR_{it} = IR rating of firm i in year t
log (MV)$_{iT}$ = natural log of the market value of equity capital of firm i at 31 March in year T
B_{iT} = equity beta of firm i in year T
T= 1997 to 2004
t = 1999 to 2002

*** indicates one-tailed significance at a 0.01 level
** indicates one-tailed significance at a 0.05 level
* indicates one-tailed significance at a 0.10 level

Best IR Officer Award N = 416

		T-2		T-1		T		T+1		T+2	
		Y_0	t	Y_0	t	Y_0	t	Y_0	t	Y_0	t
Intercept		0.090	**6.327*** **	0.150	**8.971*** **	0.102	**10.027*** **	0.100	**8.226*** **	0.114	**8.881*** **
Beta	B	0.135	**2.912*** **	0.014	**0.289**	0.046	**0.981**	0.067	**1.449***	0.001	**0.012**
Market Value	MV	- 0.070	**- 1.512***	- 0.019	**- 0.404**	- 0.060	**- 1.281**	- 0.099	**- 2.127****	- 0.030	**- 0.640**
IR Rating	IR	0.037	**0.787**	- 0.070	**- 1.481***	- 0.056	**- 1.184**	- 0.117	**- 2.498*** **	- 0.035	**- 0.733**
R^2		**0.019**		**- 0.001**		**0.002**		**0.018**		**0.002**	

Table 7.4.2.3 continued

Best Results Meeting Award N = 412

		T-2		T-1		T		T+1		T+2	
		Y_0	t	Y_0	t	Y_0	t	Y_0	t	Y_0	t
Intercept		0.156	8.554***	0.147	9.350***	0.112	8.773***	0.042	2.566***	0.072	6.522***
Beta	B	0.012	0.241	0.029	0.579	0.058	1.172	0.030	0.608	0.025	0.502
Market Value	MV	- 0.040	- 0.800	- 0.059	- 1.202	- 0.004	- 0.084	- 0.139	- 2.909***	- 0.045	- 0.949
IR Rating	IR	0.053	1.045	0.170	3.379***	0.220	4.484***	0.310	6.295***	0.250	5.085***
R^2		0.004		0.031		0.047		0.097		0.068	

Best Annual Report Award N = 381

		T-2		T-1		T		T+1		T+2	
		Y_0	t	Y_0	t	Y_0	t	Y_0	t	Y_0	t
Intercept		0.130	8.756***	0.148	8.442***	0.117	9.051***	0.084	5.476***	0.110	6.694***
Beta	B	0.015	0.292	0.012	0.225	0.014	0.274	0.008	0.149	0.020	0.391
Market Value	MV	- 0.009	- 0.170	- 0.003	- 0.063	-0.042	- 0.813	-0.009	-0.179	-0.023	- 0.453
IR Rating	IR	- 0.009	- 0.168	- 0.025	- 0.477	-0.038	- 0.732	0.018	0.340	0.058	1.116
R^2		0.004		0.001		0.003		0.001		0.004	

7.4.3 Addressing the research hypothesis for cost of equity capital

7.4.3.1 The validity of my estimates of the cost of equity capital

Although the theory supporting an expectation that effective IR should be associated with a reduced cost of equity is set out in section 7.4.4, it is also possible that the apparent fall in cost of equity for the firms with effective IR is simply due to a general fall in the market-wide cost of equity or is related to a the general level of interest rates that affect the cost of equity for all firms. However, because I have performed cross-sectional tests of the average cost of equity of the firms, I intrinsically control for any changes in economy-wide and market environment factors that may also affect the firms' cost of equity, for example the cost of debt and the level of market interest rates.

Secondly, given that my cost of equity estimates are based on forecasts of stock prices and dividends by security analysts it is very likely that they will already have factored in their forecasts of other market-wide variables into their price and dividends forecasts.

Further, to provide support for the validity of the cost of capital estimates I calculate for the firms with effective IR that comprise my data set, I set out in appendix 3 a summary of the estimates of the cost of capital in the key existing literature to compare with the estimates in my research. As shown in this appendix, the within-award range of my estimates is large but appendix 3 shows that the equivalent ranges in the prior research is also large and the percentile analysis of my cost of equity estimates shows that the averages by 25%/50%/75% percentiles are close to the overall average for each period. As can also be seen in appendix 3, the cost of equity capital estimates calculated in the existing research vary widely even within one study that uses various calculation methods and also between studies. These range from a low of 2.1% for 12,400 US firm-year observations from 1983 to 1993 in the study by Botosan and Plumlee (2005), using the Ohlson Residual Income method to the highest estimate of 22.1% for 62 US firms with low analyst following by Botosan (1997) using the Finite Horizon Gordon Growth model. The average estimates that I calculate in my research lie between these two extremes (a mean of

9.2% for the 3,113 US firms and an average of 11.5% across all of the 1,254 UK firms that I test). These results highlight the fact that there appears to be no 'right' way to calculate the ex-ante cost of equity, as I discuss in section 3.4, and that it is probably more important to use a method that is both robust and consistent in order to perform a cross-sectional analysis within any particular sample of firms over any particular time period.

7.4.3.2 Cost of equity results

The results show that the average cost of capital for 1,059 US *large firms* with effective IR falls over time, suggesting a negative relationship between effective IR and the cost of equity capital for these larger sized firms over this period of time. In addition, the regression analysis that control for firm size show that in year T+1, the period immediately following the award nominations, *the cost of capital of the firms that had received the most nominations is significantly lower than that for the firms with fewer nominations.*

The 2,054 *smaller sized US firms* have a higher average cost of equity capital compared to the large firms in almost all of the 12-month periods spanning two periods prior and two periods following their nomination in the IR awards and this is by as much as 2% higher during one period. However, as for the large firms, the average cost of equity for the small firms falls steadily over time, indicative that good IR is negatively related to the cost of capital for these smaller-sized over the time periods tested. In addition, the regression analysis shows that for the smaller firms the relationship between the number of nominations for *Best Overall IR and the cost of capital is negative and significant during the 2 periods immediately following their nomination (periods T and T+1).*

The cost of equity capital estimates for the UK firms, calculated using the same methodology as for the US firms, are of a comparable magnitude to that of the US firms during each of the periods tested. This similarity is perhaps a reflection of the weak international boundaries to trading between the UK and US capital markets, which allows investors relatively ease of trading arbitrage across national capital markets and global diversification of their investment portfolios and funds.

Because the UK firms are nominated for effectiveness in specific forms of IR, the results also provide some indications that *effectiveness in different forms and methods of IR* may affect the cost of capital differently. Firstly, this is because the UK firms deemed to have the most *effective IR Officers* benefit from a falling average cost of capital in the years immediately surrounding their nomination and the average cost of equity in each period T-2 to T+2 is lower for portfolios of firms with more award nominations in this IR award category. In addition, the regression results for the firms with the *Best IR Officers* show a significant negative relationship between the size of the cost of capital and the IR rating of firms during the *two periods immediately after* being nominated for the IR award, implying that the activities of the effective IR officers may be instrumental in reducing the size of the cost of capital.

Secondly, although the results show that effective communications during *results meetings with analysts and fund managers* are associated with a continual fall in average estimated cost of equity over time, they do not show strong evidence of any relationship between the number of award nominations in this category and cost of capital. Importantly, the regression results for these firms show a *significant positive relationship between their ratings for effective communications in their results meetings and the size of the cost of capital during all of the periods analysed.* This finding appears counter-intuitive because it is contrary to theory. However, my finding of a positive relationship between effective results meetings and the cost of capital is consistent with the findings of some seminal research on corporate communications in the more frequent forms.

For example, Botosan and Plumlee (2002) find a positive relationship between firms' AIMR ratings for 'Other Published Information' (which is essentially non-mandatory firm information disclosed in-between annual, interim and quarterly reporting dates, such as trading statements and news releases) and the cost of capital. Botosan and Plumlee suggest that their findings may be because, when firms provide more frequent and ad-hoc information to the market, this can have the effect of increasing short-term share price volatility and thereby raise the degree of risk attached to the

shares, causing investors to require a higher return to equity. Higher share price volatility will also directly affect the size of the cost of capital estimates calculated in my thesis because they rely on analysts' forecasts of share prices and future growth rates and will therefore be higher for firms with lower forecasted future values.

Finally, the results for the UK firms also show that effective communications in the more formal and structured format of the *annual report* is also associated with a fall in the average estimated cost of capital over time. However, the firms with the highest number of nominations for *Best Annual Report* do not have the lowest average cost of capital compared to the firms with fewer nominations during any of the periods tested and the regression results show *no significant relationship between the number of nominations and the cost of equity for the firms with effective annual report communications in any period.* These findings are not easy to explain and are contrary to both theoretical predictions and to findings in the existing literature. For example, Botosan and Plumlee (2002) find a significant negative relationship between firms' AIMR rating for annual reports and the cost of equity capital, as I described in section 3.4. My findings may merely be due to differences in the methodology used by Botosan and Plumlee (2002). However, they suggest that a good annual report is now regarded as only the basic minimum required by best practice IR and that any marginal improvements in annual reports have no significant effect of the cost of equity, whereas improvements in more discretionary and informal forms of IR communications are perhaps now better methods of providing cost benefits when competing to raise equity in the capital markets.

Also, a reason for my findings on effective annual reporting may relate to the findings in the research by Lang and Lundholm (1996), who test for levels of analyst coverage for firms rated in the AIMR corporate communication surveys. Lang and Lundholm find that analyst following is significantly higher for the firms with a higher 'Overall Rating' and higher ratings for 'Investor Relations' and 'Other Published Information', but are not significantly associated with the rating for the 'Annual Report'. My insignificant results for any relationship between the cost of capital and the rating for annual reports in the *IR Magazine* IR awards may be due to the same reasons as those suggested by Lang and Lundholm (1996) for analyst coverage,

who state that, "*The annual report, as a form of communication, may be necessary but does not contribute significantly to the perceived effectiveness of an overall disclosure strategy*".

This importance of the form and frequency of corporate communications is discussed further in chapter 8.

7.4.4 Theory

As described in section 4.1, *Agency Theory* and *Information Risk Theory* predicts that enhanced corporate communications can reduce the level of information asymmetry between a firm's inside management and external shareholders, leading to a reduced level of information-uncertainty as a source of risk for investors. These theories predict that reduced information-uncertainty should reduce the level of required equity returns for a firm and result in a lower cost of raising equity finance.

Overall, my research finds some empirical evidence supporting the predictions made by these theories because the firms in both UK and US firms with effective IR across a range of formal and informal communication media are found to benefit from a fall in their cost of equity capital over time.

7.4.5 Conclusions on cost of equity capital

Overall, although my findings on any relationships between the size of the firms' IR ratings and the cost of capital are mixed, I find compelling evidence that the cost of capital of my sample firms falls over the years surrounding their nominations for IR awards. Therefore I reject the null hypothesis *H04* at normal significance levels; *there is no significant relationship between effective IR and a* ***future reduced cost of equity capital.***

7.5. Chapter Summary

This chapter describes the findings of the tests I perform to explore any associations between equity returns, stock liquidity, analyst coverage and the cost of equity capital for firms with effective IR. The tests are aimed at addressing my research hypotheses, which are based on relationships found in existing literature and on outcomes predicted by theory. These hypotheses, together, propose that effective IR is associated with prior high analyst coverage and prior excess equity returns and with a subsequent increase in analyst coverage, stock liquidity and equity returns and also with a reduced cost of equity capital. Based on the results I have described above in this chapter, my conclusions on these hypotheses are as follows:

I find that the null hypotheses *H01* and *H02* cannot be rejected at normal significance levels. This is, firstly, because my findings provide no evidence that the firms earn future risk-adjusted excess equity returns, meaning that I cannot reject ***H01***, which proposes that there is *no significant relationship between effective IR and* ***future excess equity returns***. Further, because I do not find that analyst following of the firms significantly increases in the periods subsequent to their nominations in the IR awards, I cannot reject ***H02***, which proposes that there is *no significant relationship between effective IR and* ***future increased levels of analyst coverage***.

However, based on my empirical findings, the null hypotheses *H03, H04, H05* and *H06* are all rejected at normal significance levels. Firstly, because I find that the firms with effective IR have increased stock liquidity and a reduced cost of equity capital subsequent to their nominations in the IR awards, I reject ***H03****, that there is no significant relationship between effective IR and* ***future increased trading volumes of equity*** and ***H04***, that *there is no significant relationship between effective IR and* ***future reduced cost of equity capital.*** Finally, because I find that the firms with more effective IR have high prior levels of analyst coverage and prior excess equity returns, I reject ***H05****, that there is no significant relationship between effective IR and* ***prior excess equity returns*** and ***H06***, that *there is no significant relationship between effective IR and* ***prior high levels of analyst coverage.***

Based on this a summary of my conclusions, which answer the research questions that I originally posed in chapter 1, is as follows:

The following factors significantly determine firms' ratings for effective IR:

- **Prior excess equity returns;**
- **Prior high analyst coverage.**

The following factors are associated with firms' ratings for effective IR:

- **Continued high analyst coverage;**
- **A reduced cost of equity capital, and;**
- **An increase in stock liquidity.**

This concludes the chapter describing the research results. The following chapter concludes the main body of this thesis by reviewing how my main findings in the light of my research questions and by comparing and contrasting these findings to extent they are relevant to those in the existing literature and to the relationships predicted by theory.

Chapter 8. The Determinants and Effects of Effective IR

8.1 Aims of this chapter

In this chapter I review and discuss the findings described in chapter 7 and compare and contrast the extent to which they are consistent with the relevant existing literature. In section 8.2 I review the factors that appear to determine which firms are perceived to have effective IR and in section 8.3 the factors that appear to be associated with firms' ratings for effective IR during subsequent periods. Section 8.4 summarises and presents some overall conclusions.

8.2 Determinants of effective IR

As I explain in section 5.3, I test two null hypotheses which propose that the prior stock performance and prior analyst coverage of the firms with effective IR determine that the firms have, or are perceived to have, effective IR. Firstly, I test the null hypothesis *H05*, that *there is no significant relationship between effective IR and prior excess equity returns* and secondly *H06*, that *there is no significant relationship between effective IR and prior high levels of analyst coverage.* However, as I explain in my summary in chapter 7, and based on the results described in sections 7.1 and 7.2, these two null hypotheses are rejected at normal significance levels. In this section I discuss some reasons that may explain any relationship between prior excess equity returns and prior high analyst coverage and effective IR. In addition, I review why 'firm size' and the 'form and frequency of corporate communications' are also factors that appear to be important in relation to how IR is perceived, as indicated by my empirical results. This section is organised into the following sub-sections. Section 8.2.1 relates to the firms' prior excess equity returns *(H05)*, section 8.2.2 to their prior high analyst coverage *(H06)* and in sections 8.2.3 and 8.2.4 I discuss the importance of firm size and of the form and frequency of corporate communications.

8.2.1 Prior excess equity returns

The results described in section 7.1 show that the stocks of the UK firms that are given the highest number of nominations by the respondents to the IR awards survey

for effective IR earn excess risk-adjusted returns in the year prior to the surveys. However, although the smaller sized US firms nominated in equivalent US IR awards also shows high prior excess returns, the prior stock returns of the larger sized US firms are not abnormal. I discuss any significance of 'firm size' in this relationship below in section 8.2.3. Meanwhile, my findings of prior excess equity returns are in-line with those of some of the existing literature described in section 3.1 and 4.2. I summarise the main findings of this literature here to illustrate how my findings contribute to the literature and I also review how the theory described in section 4.2 can explain my findings.

Firstly, similarly Healy, Hutton and Palepu (1999) find that sustained improvements in firms' ratings in the AIMR survey of corporate communications are associated with an improvement in the firms' industry-adjusted stock returns of a cumulative average of 5% *over the period two years prior* to the first disclosure level increase and two years afterwards. In other words, they show that the stocks of these firms were also performing well prior to their high ratings in the AIMR survey. Also, in tests of the firms comprising the *UK Management Today 'Britain's Most Admired Firms'* survey, Agarwal, Brown and Taffler (2004) find that they earn *excess stock returns only over the 12-months preceding the survey* and not in any subsequent periods. Further, Fryxell and Wang (1994) test the firms in the US *Fortune Magazine 'America's Most Admired'* list, and conclude that the 'most admired' index score of the firms is only significantly associated with the firms' prior financial performance and not obviously related to the more subjective attributes that the *Fortune* survey categories describe. My findings contribute to this body of empirical evidence because, in the same way as does this prior literature, they suggest that the respondents to the *IR Magazine IR awards* survey are subject to the bias of *representativeness* described in the literature on behavioural finance. This literature explains that past excess equity returns can cast a financial 'halo' over firms, which respondents in firm-surveys appear to carry over to their high opinions of the firms in other areas, such as their IR performance.

8.2.2 Prior analyst coverage

Secondly, the test results I describe in section 7.2 show that, for both the US firms and UK firms, analyst following appears to be higher prior to their nominations for the IR awards and my regression analyses show that the relationship between levels of analyst coverage and the firms' number of IR award nominations is positive and significant in periods *both preceding and following* the time of the IR awards and in my tests of the US firms that are distinguished by size this relationship is particularly strong for smaller sized firms. Overall, this suggests the firms that are nominated for effective IR are those with which the award survey respondents are already more familiar due to their high analyst coverage. Also, combined with my findings of prior excess returns of the smaller firms, this also indicates that analysts may behave differently towards large versus smaller sized firms. In other words, analysts may only be attracted to following smaller firms with effective IR and high stock returns, but that larger firms with effective IR attract analysts regardless of their short-term stock performance.

To put my findings in context, I review here some of the most relevant findings in prior research on the relationship between effective communications and analyst coverage that I have described in section 3.2. Firstly, Lang and Lundholm (1996), test the firms included in AIMR corporate communication surveys during the 1990s and, similarly, show that the firms' levels of analyst following are significantly higher at the time the survey is conducted, for both firms with a higher AIMR 'Overall Rating' and those with a higher rating in the separate 'Investor Relations' and 'Other Published Information' AIMR disclosure categories that comprise the overall rating. Relevantly, Lang and Lundholm find no significant relationship between prior analyst following and the firms' ratings for 'Annual Report' disclosure and they suggest that this is because analysts prefer to follow firms that are effective in the most discretionary and voluntary forms of communications compared to formal reporting methods. I discuss the importance of the form and frequency of corporate communications below in section 8.2.4. Meanwhile, Chung and Ho (1996) find that analyst-following is significantly higher for firms with a higher market value and Bhushan (1989b) also finds a significant positive correlation between analyst

following and firm size, but that analyst following is also higher for firms with a past low equity return variability, less business diversification and for firms with a high correlation between their stock returns and market returns, together suggesting that more analysts follow firms that are less risky and perhaps easier to analyse and to make performance forecasts for.

Finally, the findings of the study by Botosan (1997) underline the importance of analyst coverage in any relationship between effective IR and a reduced cost of equity capital. This is because she finds a significant negative relationship between enhanced corporate disclosures in annual reports and the cost of equity capital, but *only for firms with low analyst coverage.* Botosan suggests this may be because firms with high analyst coverage can rely on their communications with their analysts as an effective method of communicating with the market, rather than via their annual reports. More generally, this suggests that if analyst following is higher for larger firms, it is more effective for larger firms to focus on more informal communications with their analysts, whereas it is more effective for smaller firms with lower analyst following to concentrate on effectively communicating the information contained in their annual reports. To pursue this issue further, I discuss any importance of the form, compared to the content, of corporate communications in relation to my research hypotheses in section 8.2.4.

In summary, my findings are consistent with the theories described in behavioural finance, which predict that psychological heuristics relied on by analysts when assessing firms can lead them to show preferences for firms they already follow because these firms are more 'available' and easier to recall. Further, my findings are consistent with other research on analyst coverage, which also suggests that analysts prefer to follow larger firms, probably because there is more likely to be a wealth of existing information on large firms that results in lower information search-costs, time and effort on their part of analysts. Finally, I also find that analyst coverage is higher for firms with more effective communications, which presumably makes the analysts' roles less time-consuming and easier. The following section concerns the importance of 'firm size' in relation to effective IR.

8.2.3. Firm size

My tests both show that analyst coverage of smaller firms with effective IR are more consistently related to the firms' number of IR award nominations than for larger sized firms and also that only the smaller sized US firms that are subsequently rated more highly for their IR have excess equity returns. These findings and some prior empirical research, which I describe in section 3.2 and of which the most relevant is summarised here, support the proposition that analysts appear to behave differently towards small firms compared to large firms.

Firstly, Brown and Kim (1993) find, in interviews with analysts, that they do not expect to receive as much voluntary and discretionary information from the managers of smaller firms compared to the high level of information they expect from larger firms and that any supplementary information from small firms is normally only concerning 'good news' and not 'bad news'. Brown and Kim suggest that sophisticated short-term investors may also act on this assumption, and that this results in a biased attitude of both analysts and investors towards the information they receive from smaller firms. Further, Arbel and Strebel (1983) suggest that the stocks of smaller firms must generate higher stock returns to gain analyst following and investor-interest that they lack, primarily due to *"lower information-availability"* in the market about them. Arbel and Strebel suggest that lower levels of analyst research about smaller firms may be a primary cause of high information-risk that investors appear to associate with the stocks of smaller firms. In other words, investors demand a 'premium for uncertainty' caused by lack of information, to compensate them for the need to do their own fundamental analysis. Finally, my findings are also supported by IR industry research and by reports in the financial media, which present the view that smaller firms face particular problems in attracting analysts, as I have described in section 3.2. In summary, my research supports and contributes to this body of empirical and industry literature, by showing that firm size is an important factor in the relationship between effective IR and analyst coverage and stock pricing, and that some firms only benefit from the informational advantages that come from analyst coverage when they differentiate themselves by having an effective IR policy.

8.2.4. The form and frequency of corporate communications

My tests of the UK firms nominated in the UK IR awards for 'Best IR Officer', 'Best Results Meetings' and 'Best Annual Report' categories, that I describe in chapter 7, suggest that the form and frequency of corporate communications are also important in any relationship between effective IR and stock liquidity and stock price. This is firstly because I find that the stock liquidity of firms nominated for *Best IR Officer* and *Best Results Meeting* is *significantly positively* related to their number of award nominations, but that there is no such relationship for the firms in the *Best Annual Report* award, suggesting that more frequent and informal effective communications have a greater effect in stock liquidity compared to formal reporting methods.

Secondly, I find that the firms nominated for the *UK Best IR Officer* and the *UK Best Results Meeting Awards* also have a reduced cost of equity capital over the years immediately surrounding their nominations in these awards. However, the regression analyses show the relationship between their number of nominations and the cost of capital is only significant for firms in the *UK Best IR Officer Award* during the *periods immediately after* the IR awards, whereas there is a significant *positive relationship* for firms in the *Best Results Meeting Award during all of the periods* analysed and *no relationship* for firms nominated for *Best Annual Report*.

Together, these findings suggest that effective IR in the most informal and frequent forms, directly from an IR officer and during meetings between senior managers of firms and their investors and analysts, may both have a greater positive impact on stock liquidity and in reducing the cost of capital, compared to more formal corporate communications in annual reports. It is perhaps in these areas of communications, which are above and beyond meeting obligatory and formal reporting requirements, where effective IR may provide most value. This proposition is also consistent with findings in some existing literature described in section 3.4, of which the most relevant I summarise here to for illustration.

Firstly, Lang and Lundholm (1996) find that analyst coverage is significantly higher at the time that firms receive high ratings in the 'Investor Relations' and 'Other

Published Information' categories of the AIMR corporate disclosure survey, but is not significantly higher for firms rated highly for the 'Annual Report' AIMR category. Lang and Lundholm propose that this is because the most discretionary and informal forms of communications are more effective in attracting analysts, and that this may explain why firms that only focus on formal communications, such as in annual reports, have lower analyst coverage. This is important for firms because lower analyst-intermediation may reduce the effectiveness of how their annual reports are interpreted and understood in the capital markets. This may result in a failure to reduce perceived risks associated with a firm or any information asymmetries between the firms and their investors, which information risk and agency theories predict to should be reduced by effective corporate communications.

Meanwhile, although my results show no significant relationship between firms' number of 'Best Annual Report' IR award nominations and their cost of capital, this is contrary to the findings of Botosan and Plumlee (2002). Botosan and Plumlee find a *significant negative relationship* between firms' ratings in the AIMR 'annual report' disclosure category and cost of equity capital. This may be because, as described in section 3.4, their study was set in the capital market during the 1990s, whereas my research is set in a more recent period and also because Botosan and Plumlee used the AIMR rating to measure the quality of firms' annual reports that may be a less robust method for rating firms' disclosure quality in particular disclosure categories, compared to the *IR Magazine* IR awards.

However, Botosan and Plumlee (2002) do find a positive relationship between firms' AIMR ratings for 'Other Published Information' and the cost of capital, which is consistent with my findings of a positive relationship between cost of equity and firms' nominations for the 'Best Results Meeting' IR award. These disclosure categories are similar, because they both relate to more informal, frequent and discretionary forms of communications. In fact, the AIMR define this disclosure category as *"non-mandatory firm information disclosed in-between annual, interim and quarterly reporting dates, such as trading statements and news releases*".

Botosan and Plumlee (2002) suggest that these findings for the 'Other Published Information' AIMR category is because more frequent and ad-hoc information about a firm encourages an 'investor-clientele' effect, whereby more timely disclosure attracts a greater proportion of transient, short-term investors whose trading activities have a undue volatility-increasing effect on stock returns. An increase in price volatility may increase perceived risk attached to the firms' stocks, causing investors to require a higher return. Higher sprice volatility will also directly affect the cost of capital estimates calculated by both Botosan and Plumlee (2002) and also those that I calculate in my thesis, because our methodology relies on analysts' forecasts of share prices and future growth rates which may affected by prior share price volatility levels.

In summary, my findings contribute to a body of existing literature suggesting the *form* of IR communications may be as important as the *content* of the information. This concludes my discussion of the determinants of effective IR. In the following section, 8.3, I review and expand upon subsequent factors that appear to be associated with effective IR.

8.3 Effects of effective IR

As explained in section 5.2, in my thesis I also test for any relationship between the firms' number of IR award nominations and their stock returns, stock liquidity, analyst coverage and cost of equity capital in periods subsequent to the IR awards.

Firstly, in *H01* I propose that there is *no significant relationship between effective IR and future excess equity returns* and in *H02* that there is *no significant relationship between effective IR and future increased levels of analyst coverage*. Based on the results described in section 7.1 and 7.2, none of the firms have significant excess stock returns in the subsequent periods and the firms' level of analyst coverage does not significantly rise or fall in the subsequent periods, so there is no significant empirical evidence to reject *H01* or *H02*.

Further, *in H03* I propose that there is *no significant relationship between effective IR and future increased trading volume of equity* and in *H04* that there is *no significant relationship between effective IR and a future reduced cost of equity capital.* Based on the results described in section 7.3 and 7.4, null hypotheses *H03* and *H04* are rejected at normal significance levels.

In summary, I find that the following firm characteristics appear to be subsequently associated with effective IR:

8.3.1. Reduced cost of equity capital *(H04)*

8.3.2. Increased stock liquidity *(H03)*

8.3.3. Continued high analyst coverage

8.3.1 Reduced cost of equity capital

Firstly, the results I describe in section 7.4 show that the average cost of equity capital of the firms deemed to have effective IR reduces in the periods subsequent to the IR awards. Information risk and agency theories together predict that enhanced IR should result in a reduced cost of capital but, as described above in section 8.2.4, I find that the sign and strength of any subsequent relationship between the firms' number of IR award nominations and their estimated cost of capital depends upon the form in which IR is provided by these firms. More specifically, for the US firms and for the UK firms nominated for the '*Best IR Officer'* award, I find a *significant negative* relationship between their number of nominations and cost of capital in periods both preceding and following the month of their nominations. However, for the UK firms nominated for '*Best Results Meetings'* there is a *significant positive* relationship in periods both preceding and following their nominations, whereas for the UK firms nominated for *'Best Annual Report'* I find *no significant relationship* in any prior or subsequent period.

Firstly, I find a negative relationship between my cost of equity estimates and the firms' ratings in the *Best IR Officer* award. Botosan (1997) also finds a negative relationship between enhanced communications and the cost of equity capital for firms with low analyst following. Although Botosan only measures communication-

quality by annual report disclosures she suggests that the disclosure index she uses is a valid proxy to measure a firm's overall communications because "*annual report disclosure levels are positively correlated with the amount of disclosure provided via other media*", (Botosan, 1997). Further, research by Hail (2002) provides further empirical support for a significant negative relationship between enhanced corporate disclosure, measured by the Swiss Banking Institute disclosure index, and the cost of equity capital based on 73 Swiss firms in one year (2000).

However, Botosan and Plumlee (2002) find a significant negative relationship between the cost of equity and ratings of firms in the AIMR survey 'Annual Report' disclosure category, whereas I find that effective IR ratings for annual reports have no relationship with the cost of equity. Also, contrary to my findings for the *Best IR Officer* award, Botosan and Plumlee (2002) find no significant relationship between cost of capital and ratings for the AIMR 'Investor Relations' disclosure category, implying that *the quality of investor relations makes no difference to the size of the cost of equity capital.* Some of my findings are therefore inconsistent with Botosan and Plumlee (2002). Reasons for these divergences may lie in some weaknesses in the AIMR survey rating to precisely measure effective IR and weaknesses in their method for estimating the cost of capital or because their results may only be relevant for the US firms they sample and during the time periods they test (1986-1996), and these are issues that I have referred to already in section 3.4. I set out any possible weaknesses in my own methodologies that may have resulted in a divergence of our findings below in chapter 9.

However, my other findings on the relationships between effective IR and cost of capital are consistent with prior research that I have reviewed in section 3.4 and summarise here. Firstly, consistent with my findings of a positive relationship between the cost of capital and the number of nominations for the *IR Magazine Best Results Meeting* award, Botosan and Plumlee (2002) also find *a significant positive relationship* with firms' AIMR 'Other Published Information' ratings 1986-1996. These two disclosure categories both measure the quality of the firms' corporate

communications in forms that are more timely and discretionary compared to annual regulatory reporting.

Interestingly though, the empirical results of Gietzmann and Ireland (2004), concerning the timely firm disclosures (that I aim to measure in the 'Best Results Meetings with Analysts and Fund Managers' IR award) conflict with both my own and with those of Botosan and Plumlee (2002). Gietzmann and Ireland find a *significant negative relationship* between the number of Regulatory News Service (RNS) UK firms' releases, which they use as a proxy for more *"timely disclosure"*, and the cost of capital, although only for firms making aggressive accounting choices (those making more discretionary accruals). For more conservatively accounting firms they find *no significant relationship* between timely disclosure and the cost of capital. Gietzmann and Ireland suggest that the reason for their different findings is primarily that the AIMR rating used by Botosan and Plumlee (2002) as a proxy for the quality of disclosure is probably too imprecise to effectively capture some aspects of quality of a firm's communications, or that the model Botosan and Plumlee use fails to include some correlated variables regarding corporate communications, such as accounting method choice. To the extent that this issue also affects my use of the *IR Magazine* IR awards as a measure of effective IR, in chapter 9 I suggest some possible methods for a more refined measure of IR performance for future empirical research in this area.

Summary discussion on any relationship between IR and the cost of equity

Overall and in summary, the current literature on the relationship between effective IR and cost of capital provides conflicting results, suggesting that any relationship between disclosure quality and the cost of capital is complex and perhaps also varies in nature according to the time period tested and the state of the market in which the firms tested are operating. These diverse research findings may also indicate that some of the models used to estimate the ex-ante cost of equity are inadequate, that models used in current research omit some correlated explanatory variables or due to the difficulties in measuring effective IR. I make some suggestions for future research on methods of measuring IR performance in section

7.5 and in chapter 9. Meanwhile, measuring expected/ex-ante cost of equity is difficult because by its very nature is a future variable and it is hard to know by what standards and criteria participants in the capital markets form their expectations of a firm's cost of equity. A model to estimate the cost of equity, such as the Gordon (1997) finite horizon dividend growth model is only one amongst several possible models that can be used and can only be a 'best estimate', based on the expectations that are intrinsic in the analyst' stock price and growth forecasts used in the estimation model, taken from databases such as I/B/E/S and FirstCall. In the following section I discuss my findings from testing the firms' subsequent stock liquidity.

8.3.2 Increased stock liquidity

As described in section 7.3, my tests also show that stock liquidity of both US firms and UK firms with effective IR, using several different methods for measuring liquidity, significantly rises over the time periods tested. Perhaps most notably though, all of the firms show a significant increase in the 'liquidity ratio', a measure that is particularly salient because it measures how equity trading volumes change in relation to changes in share price over the same period. The share price-effect of how investors trading activity is probably a key concern for the IR manager and for senior management of listed firms. My findings are consistent with information risk and agency theories, as described in section 4.1, and also with the prior empirical research on the relationship between effective IR and stock liquidity described in section 3.3 which is concisely summarised by Amihud and Mendelson (1986) when he states *"A corporation can affect liquidity – and consequently its cost of capital – by the amount and quality of the information it releases to investors"*, Amihud (1989).

8.3.3 Analyst coverage

Finally, as described in section 7.2, as well as finding a significant *positive relationship* between the number of nominations that the firms receive in the IR awards and their prior levels of analyst coverage, I find that this positive relationship continues to be significant in periods following the IR awards. Because I find that analyst coverage appears to both lead and lag effective IR, this suggests that high

coverage may *both determine and be an effect* of effective IR. This proposition is consistent with a similar concept established in the existing literature that I have described previously in section 3.2 but summarise once more to illustrate.

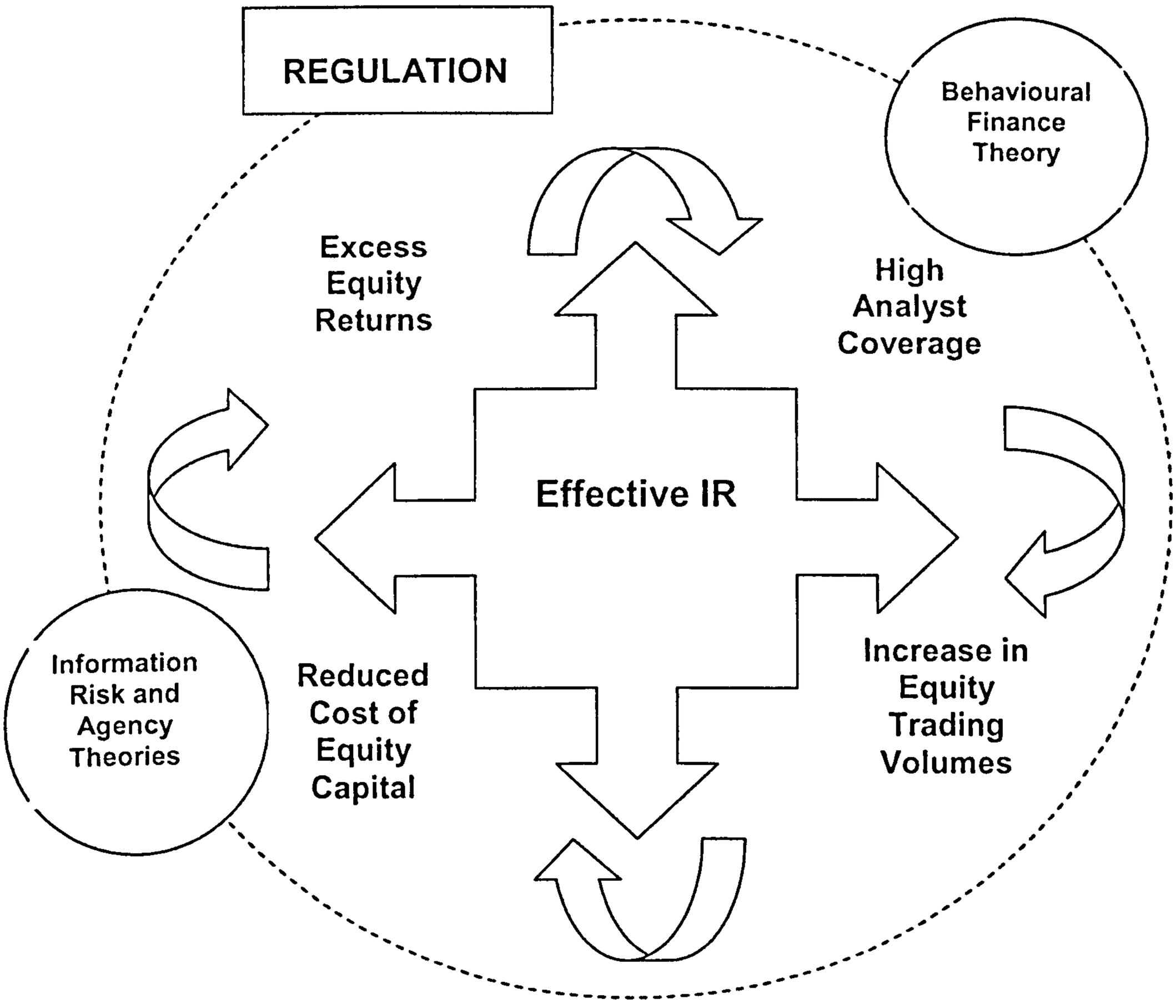
Firstly, O'Brien and Bhushan (1990) also find that firms' levels of institutional ownership appear to have a simultaneous influence on analyst following. They find that high levels of analyst following both lead and lag high levels of ownership and vice versa. O'Brien and Bhushan suggest that this is because information contained in analysts research influences the investment decisions made by fund managers at financial institutions and therefore influences a firm's level of institutional ownership, which at the same time increases the demand for the services of security analysts and provides a continued motivation for analysts to follow the firm. Further, Hussain (2000) also finds a significant two-way positive relationship between the level of analyst following and institutional ownership and similarly suggests that increased institutional ownership encourages continued analyst following, because increased institutional ownership creates a higher demand for information from analysts about firms in which financial institutions invest. The propositions that are suggested in this prior literature are akin to my putative simultaneous relationship between analyst coverage and effective IR. In other words, high coverage encourages a firm to maintain to effective IR policy and, in turn, motivates analysts to cover the firm. Any endogenous relationship between analyst coverage and effective IR, which my tests indicate, may also be due to some of the structural arrangements surrounding the capital markets information environment. This is because buy and sell-side analysts are normally employed by institutional funds managers and investment banks to produce equity research and so they are more likely to follow firms in which fund managers already invest and with which they are already very familiar. This arrangement may explain why analysts appear to consistently follow certain firms over a period of years. In addition, because 'soft commissions' are paid to some sell-side analysts, in the form of higher transaction costs by firms and buy-side investment banks for additional sell-side research and market data, these financial incentives may also encourage analysts to continue to cover firms with which the investment bank employing them has an on-going relationship. In summary, based

on my findings, I propose that firms appear to operate in a form of 'circular information environment', whereby analysts can be attracted to follow firms that provide effective IR and then consistently follow these firms, but that firms that fail to attract analysts may remain outside this 'virtuous circle' and fail to benefit from the advantages that increased exposure from analyst research may reap.

8.4 Chapter summary

In my thesis I propose that there are relationships between effective IR and prior excess equity returns and prior high analyst coverage and that effective IR is associated with increased liquidity, a reduced cost of equity and future high analyst coverage. The following diagram provides an overview of the findings of my research upon which I base these propositions, whereby the activities of research analysts appear to play a pivotal role in a putative 'circular information environment' in which firms appear to operate:

The Circular Information Environment



This flow diagram provides a diagrammatical overview and summary of my thesis. At the centre it shows a firm with effective IR that operates in a framework of regulation governing its external communications. My thesis finds that firms with effective IR have recently high-performing stocks and/or high analyst coverage. These two attributes are likely to simultaneously both motivate the senior managers of firms to adopt an effective IR strategy and *at the same time* probably assist firms in communicating effectively, through a pre-existing network of analysts who supply a ready and willing investor-audience. These attributes may also be psychological 'signals' to investors and analysts, which behav*io*ural finance predicts can increase firms' *availability* and become *representative* of firms and so cast favourable 'halos' over firms in the minds of their investors and of the analysts producing forecasts and analysis on the firm. My thesis also shows that firms with effective IR simultaneously have increased subsequent stock liquidity and continued high analyst coverage. Increased liquidity probably results from enhanced information-availability from analyst' research, which reduces *information asymmetry* and information-related perceived equity risk. Finally, firms with a high market valuation and liquid stocks, which are well-known due to the large amount of information about them in the market, are more likely to benefit from a low cost of raising equity finance and be able to generate higher stock returns that attract investors and analyst following. These interacting causes and effects form the 'circular information environment', in which firms appear to operate and which largely relies upon effective IR.

Summary discussion on measuring IR performance

The validity of the findings in this thesis all rely upon the methodology I have used to measure IR performance. However, it should be noted that my use of the number of nominations in the IR Magazine IR awards to measure IR performance can only be a 'best estimate'. This is because IR is a very difficult concept to measure because it is more of a 'process' than an 'event', is a subjective construct and can probably only be judged relative to the (changing) expectations and judgemental benchmarking by the audience of an IR function. This issue is further discussed in section 9. 2.1 below. This concludes the main body of my thesis. The following chapter sets out some unanswered questions and some suggested areas for future research in IR.

Chapter 9. Review of the thesis

9.1 Summary of the thesis chapters

In this thesis I set out to test associations between the equity returns, cost of equity capital, stock liquidity and analyst coverage and a proxy measure for the effectiveness of the investor relations of a sample of US firms and UK firms nominated for the *IR Magazine IR Awards* 1999-2002. In chapter 2 I describe the IR industry to establish the context in which this thesis is set and section 6.1 explains how I construct my samples of firms with effective IR.

Chapter 3 reviews the existing literature to the extent it relates to relationships between effective IR the variables that I set out to test. It is to this wide body of literature that this thesis contributes. I then describe the framework of theories in chapter 4, which together support my research hypotheses developed to test for the firms with effective IR. Based both on relationships predicted by these theories and on the findings in the existing empirical literature reviewed in chapter 3, I develop the research hypotheses in chapter 5.

Chapter 6 explains the methodologies I employ to test these hypotheses and chapter 7 describes the results of the tests performed on the sample firms and how these are related to outcomes predicted by relevant theory. Chapter 8 reviews each of the factors that this research shows to be determinants and effects of effective IR and the extent to which my findings are in-line with, or contradict with, those in the relevant prior research. This chapter presents a concluding proposition that the information search and dissemination activities of security analysts, who are an important link in the chain of communications between firms and their investors, appear play a pivotal role in any link between the determinants and effects of effective IR in the circular corporate communications environment.

9.2 Unanswered questions

This section discusses some recognised areas of weakness in the methodologies employed in this thesis, which future research on IR may seek to address.

9.2.1 Reliability of the measure of effective IR

Although section 6.1 explains the reasons justifying the use of *IR Magazine's IR Awards* number of nominations per firm as a proxy measure of effective IR, there are potential weaknesses in this approach. The first issue concerns whether effective IR is actually a time-specific 'event', which is at all amenable to a time-specific rating or measure, or whether it is only realistic to measure IR performance over a longer time period that the procedural nature of IR, i.e. *IR is an on-going process rather than an event*. Although the respondents to the *IR Magazine IR Awards* are asked to assess firms' IR performance over the previous 12-months, it is impossible to know whether they actually do this and whether done consistently across all the different respondents in any one year or over periods of time. Secondly, the degree by which a firm's IR policy is effective is probably not an objective fact because it is by definition assessed according to the subjective perceptions of its audience. However, it is probably impossible to know what these 'true' perceptions are for a large sample of firms. Although the *IR Magazine IR Award* respondents may, in effect, be expressing opinions based on their own perceptions of firms IR, it is not however possible to verify whether their expressed opinions are a true reflection of their actual opinions.

Finally, the period over which my tests are performed (1999 to 2002) is noted for the occurrence of several corporate 'accounting scandals' (i.e. the 'Enron era') and so may not be representative of a 'normal' time period over which to test IR performance in a more general sense. This is also a period spanning the events of September 11th, which probably also had a major effect on stock market pricing and behaviour and, crucially, on investors' attitudes to risk. All of these factors may therefore have affected the size and direction of the empirical results in my thesis.

9.2.2 Analyst bias

The possibility that analysts have biased opinions and that they may be biased in their research activities may affect my research is several ways. Firstly, a large percentage of the respondents to the I*R Magazine IR Award* survey are analysts (the break-down of respondents is shown in tables I and J in appendix 1). These

analysts may nominate firms for the *IR Magazine* awards for reasons other than that they actually consider the firms to have the most effective IR. For example, they may name a firm simply because they are more familiar with it through their research role as a sell or buy-side analyst. However it is any biases resulting from high familiarity that underlies the bias of *representativeness*, which is one of the main behaviours that can affect decision-making, described in the behavioural finance literature in section 4.2. Therefore I explicitly recognise the potential for any such bias to affect the results of the tests that I perform.

Further, there is the potential that sell-side security analysts may be influenced to nominate firms with which the investment banks or other institutions employing them have other corporate business. Analysts may be more or less favoured towards firms about which they have access to other information or subject to biases due any liaisons between firms and their employing institutions. However, the risk that this may bias their nominations in the IR awards is minimised to a degree by both the legislation governing such activities described in chapter 2 and because, as shown in the statistics in appendix 1, the respondents for the US IR awards in fact are only 30.1% sell-side analysts and the UK only 44.8%, the balance being employed in the buy-side (either as brokers or fund managers). A final issue relates to whether analyst' bias affects the share price and dividend forecasts used to calculate the cost of equity capital measure. As described in section 6.5, my cost of equity capital measure is calculated using data from the *Thomson Financial FirstCall* database, using analyst' consensus forecasted price, dividend and growth rates. Although this follows an established research methodology, for example Botosan and Plumlee (2005), if the data published in this database is biased then the cost of equity calculations will incorporate this bias. In addition, the number of analysts making forecasts published in this database is the basis for measuring analyst coverage, as explained in section 6.3. To any extent that the database does not reflect the true number of analysts covering a firm, then the results of my tests concerning analyst coverage may be spurious.

9.2.3 'Noise' in the data

This concerns the potential that the source data used in the tests in my thesis include a large amount of systematic 'noise' that systematically affect any of the variables used in my methodologies. Although I have attempted to minimise 'noise' by adopting established methodologies used in the existing literature any remaining noise in the data, which is not explicitly recognised as an endogenous correlated variable in my research methodologies may render the test results spurious.

9.2.4 The 'ex-post' versus the 'ex-ante' cost of equity capital

The aim in this research is to test the relationship between IR performance and the ex-*ante* cost of equity capital, being that which reflects the consensus of investors' current *expectations* about a firm's cost of equity. Therefore, as explained in section 6.5, it is intuitively incorrect to use ex-post stock prices to estimate this future value. For this reason, and based on an established research method, I calculate the ex-ante cost of equity by relying on analysts' forecasts about firms future performance to represent market' consensus expectations of future performance. Any weaknesses involved in using these forecasts are discussed above in section 9.2.2.

Problems with using past realised returns is the same conundrum discussed by Black (1993), in discussing some existing research that tests the relationship between equity beta and expected equity return and that finds that the relationship is weaker than that predicted by CAPM model. Black (1993) attributes these findings to either "*data-mining*" by the researchers, or as being due to the research using realised returns as an imperfect proxy for future expected returns, stating that "*Using data on realised returns is limited and noisy*". Any problem due to "*noise inherent in using realised returns*" is also discussed by Shefrin and Statman (2004), when they seek to explain their regression results that test the relationship between 'expectations of returns' and 'realised returns', which show a negative coefficient over the whole period tested, but a positive coefficient in some discrete years and that the coefficients change from sign from one year to the next.

9.2.5 A 'triple test'

The findings of my research are a result of a 'triple test' of:

- The efficiency by which market prices and volumes react to new information from the IR function of the firms;
- The validity of the models used to measure the relationship between effective IR and equity pricing, liquidity and analyst coverage (the 'bad model' problem), and:
- The validity of my measurement tool of effective IR: *The IR Magazine IR Award* survey nominations.

Therefore the validity of my test results may be compromised by weaknesses in the any of these areas. In my thesis I have provided support for my chosen method for measuring effective IR and for the models I use in my empirical tests, but make some suggestions to address remaining weaknesses in these areas in section 9.3 below.

9.2.6. Data mining

The findings of this research may be the result of 'chance' or may only be specific to the sample of firms tested or during the time periods analysed and this may reduce the ability to generalise from my findings.

9.3 Suggested areas for future research

9.3.1. A control sample of matched firms with 'non-effective IR'

The aim of my thesis is to test a pre-defined sample of firms with effective IR for characteristics that prior research and theory indicate may be determinants and effects of effective IR. Because my measure of effective IR is based on the number of nominations received by firms in annual IR awards, this means I can test for changes in levels of the firms' characteristics between periods prior to and subsequent to the awards and also for any relationships between the firms' number of nominations and these characteristics during individual years, which provide the empirical evidence to meet the precise aims of my thesis. However, further empirical research on any relationships between stock pricing, stock liquidity and analyst coverage and effective IR could include additional tests of a control sample of firms with 'non-effective IR', although it is not clear how firms can be objectively divided into those that have effective and non-effective IR. In other words, although the firms nominated for IR awards presumably are those that are deemed to have the

most effective IR when they are nominated, this does not necessarily imply that other non-nominated firms actually have ineffective IR or merely *less effective* IR and whether the nominations simply reflect the stated and subjective opinions of the parties making the nominations. This is the same problem I discuss above in sub-section 9.2.1 and in the following sub-section, that IR is a procedural and qualitative construct that is hard to measure.

9.3.2. Measure of effective IR

As alluded to above, future research on IR could make use of additional or alternative methods to measure IR performance, which could include sources such as IR ratings from *Extel* and *Standard & Poor's (S&P)*. Researchers could also give consideration to incorporating 'softer' IR measures, such as feedback from the investors and analysts who are the main audience of IR audience, although access to the necessary data may be difficult. Future research could also test the effect of IR longer periods in order to explore more sustained levels of IR performance.

9.3.3. Liquidity

In my thesis I measure stock liquidity using levels of, and changes in, the firms' equity trading volumes. However, future research may attempt to replicate my analyses using alternative established liquidity measures, such as the bid-ask spread, or by modifying the models I employ.

9.3.4. Cost of equity capital

Further research on assessing the validity and robustness of estimates for calculating the ex-ante cost of equity capital is required because despite the overwhelming consensus in the literature I described in chapter 3, which finds that estimates of the cost of capital based on realised returns are inadequate, at present there is insufficient academic consensus over which forward-looking valuation methodology to use. Research such as by Guay, Kothari and Shu (2003) , which attempts to improve on methodologies are encouraging in this direction. Because analysts' price and earnings forecasts may be biased because some analysts fail to

update their forecasts in the light of very recent share price movements, Guay, Kothari and Shu adjust the forecasts in two ways. Firstly, they include recent price movements as a control variable and, secondly, they so not include "*stale*" analyst' forecasts in their valuation models, finding that both of these methods improve the strength of the relationship between ex-ante cost of capital estimates and realised equity returns.

Such issues have not, heretofore, been addressed in the literature.

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Appendix 1

Descriptive Statistics of Sample Firms

This appendix shows the details of the final samples that form the basis for all of the tests in this thesis. The tables below show the following:

- All IR award categories in the *UK* (1999-2002) *and US* (2000-2002) *IR Magazine*;
- The number of nominations in UK and US IR award categories I test in my thesis;
- The numbers of firms in each portfolio of UK and US firms by IR award category;
- The total numbers of buy and sell-side respondents in the UK and US IR award surveys by year.

UK *IR Magazine* IR Award Categories

As shown below, although the number of UK IR awards and the IR categories are fairly consistent across 1999 to 2002, some new award categories were made in 2002 and since 2001 some of the key IR categories are awarded for FTSE 100 and Non FTSE 100 firms separately.

Table A **UK IR Award Categories**

	1999 and 2000
1	Best IR Officer
2	Best Results Meeting
3	Best Annual Report
4	Best Communication of Shareholder Value
5	Best Board Communications
6	Best IR for a New Issue
7	Best IR Website
8	Best IR During a Takeover
9	Best IR for a Loss Maker
10	Best IR for an AIM Company
11	Best IR During a Crisis
12	Best IR Progress
13	Best IR for a FTSE 100 Company
14	Best IR for a FTSE 250 Company
15	Best IR Smaller Company
16	Best IR US Company
17	Best IR European Company

Table B

	2001		2002
1	Best IR Officer FTSE 100	1	Best IR Officer FTSE 100
2	Best IR Officer non FTSE 100	2	Best IR Officer non FTSE 100
3	Best Results Meeting FTSE 100	3	Best Results Meeting FTSE 100
4	Best Results Meeting non FTSE 100	4	Best Results Meeting non FTSE 100
5	Best Annual Report FTSE 100	5	Best Annual Report FTSE 100
6	Best Annual Report non FTSE 100	6	Best Annual Report non FTSE 100
7	Best Board Communications	7	Best Board Communications
8	Best Board Communications non FTSE 100	8	Best Board Communications non FTSE 100
9	Best IR for a New Issue	9	Best IR for a New Issue
10	Best IR Website	10	Best IR Website
11	Best Internet Communications	11	Best Internet Communications
12	Best IR During a Takeover	12	Best IR During a Takeover
13	Best Shareholder Value FTSE 100	13	Best Shareholder Value FTSE 100
14	Best Shareholder Value non FTSE 100	14	Best Shareholder Value non FTSE 100
15	Best IR for a Loss Maker	15	Best IR for a Loss Maker
16	Best IR During a Crisis	16	Best IR During a Crisis
17	Best IR Progress FTSE 100	17	Best IR Progress FTSE 100
18	Best IR Progress non FTSE 100	18	Best IR Progress non FTSE 100
19	Best IR for an AIM Firm	19	Best Corporate Advertising
		20	Best Mgt Disclosure
		21	Best Social Reporting
		22	Best IR for an AIM Firm
		23	Best IR US Firm
		24	Best IR European Firm
		25	Best IR Asian Firm
		26	Best IR Emerging Country

Table C **US IR Award Categories**

	2000	2001	2002
1	Best Overall IR	Best Overall IR	Best Overall IR
2	Best Asian Firm IR	Best Annual Report Small	Best Annual Report (Small) Cap
3	Best Asian IR Officer	Best Annual Report Large Cap	Best Annual Report (Large)
4	Best Annual Report Large Cap	Best CEO Large	Best Face to Face Meeting Small
5	Best Annual Report Small	Best Financial Media Relations Small	Best IR Website Small
6	Best Corporate Advertising Large	Best Corporate Governance Large	Best Financial Media Relations Small
7	Best Corporate Advertising Small	Best CEO Small	Best Mgt Disclosure Large
8	Best Europe IR	Best IR Officer Small Cap	Best Corporate Governance Small
9	Best Europe IR Officer	Best IR Officer Large Cap	Best Corporate Governance Large
10	Best Face to Face Meeting Large	Best Face to Face Meeting Large	Best IPO Program Large
11	Best Face to Face Meeting Small	Best Corporate Advertising Small	Best Mgt Disclosure Small
12	Best Financial Media Relations Large	Best Corporate Advertising Large	Best Financial Media Relations Large
13	Best Financial Media Relations Small	Best Senior Mgt Communication Small	Best Latin America IR
14	Best IPO Program Large	Improved IR Program Large	Best IR During a Contested Takeover
15	Best IPO Program Small	Best Face to Face Meeting Small	Best Senior Mgt Communication Small
16	Best IR During a Contested Takeover	Best IPO Program	Best Corporate Advertising Small
17	Best IR During a Friendly Takeover	Best Latin America IR	Best Europe IR
18	Best IR Large Cap	Asia IR Officer	Best Asia IR
19	Best IR Officer Large Cap	Canada IR Officer	Best Canada IR
20	Best IR Officer Small Cap	Best IR During a Contested Takeover	Best CEO Small
21	Best IR Small Cap	Best Conferencing	Best CEO Large
22	Best IR Website Large	Best IR During a Friendly Takeover	Best IR Website Large
23	Best IR Website Small	Best Friendly Takeover Small	Best Uncontested Takeover Small
24	Best Latin America IR	Best UK IR Officer	Best Face to Face Meeting Large
25	Best Management Disclosure Large	Best IR Program Large	Best IR Officer Large Cap
26	Best Senior Mgt Communication Large	Best Media Relations Large	Best IR Officer Small Cap
27	Best Tele/video Conference Large	Best Senior Mgt Communication Large	Best IR Program Large
28	Best Tele/video Conference Small	Best Media Relations Small	Best UK IR
29	Best Use of Technology Large	Best Tele/video Conference Large	Best IR Program Small
30	Best Use of Technology Small	Best Tele/video Conference Small	Best Uncontested Takeover Large
31	Canada IR Officer	Best Europe IR Officer	Best Corporate Advertising Large
32	Improved IR Program Large	Best Financial Media Relations Large	Best IPO Program Small
33	Improved IR Program Small	Best Corporate Governance Small	Best Senior Mgt Communication Large

Table D

US and UK Sample Sizes

All nominated US firms by year and IR award

Award/ Year of Award	**2000**	**2001**	**2002**	**Total**
Large firms	361	216	482	**1,059**
Small firms	1,024	409	621	**2,054**
Large and small firms	**1,385**	**625**	**1,103**	**3,113**

All nominated UK firms by year and IR award

Award/Year of Award	**1999**	**2000**	**2001**	**2002**	**Total**
Best IR Officer	65	95	131	170	**461**
Best Results Meeting	63	95	114	140	**412**
Best Annual Report	59	81	101	140	**381**
Total	**187**	**271**	**346**	**450**	**1,254**

Table E

UK Firms Portfolio Sample Sizes By Year

Best IR Officer

Portfolios	1999	2000	2001	2002	Totals
1	21	31	44	57	**153**
2	21	28	43	55	**147**
3	23	36	44	58	**161**
	65	**95**	**131**	**170**	**461**

Best Results Meeting

Portfolios	1999	2000	2001	2002	Totals
1	20	32	37	47	**136**
2	22	28	39	44	**133**
3	21	35	38	49	**143**
	63	**95**	**114**	**140**	**412**

Best Annual Report

Portfolios	1999	2000	2001	2002	Totals
1	20	26	33	47	**126**
2	16	27	34	44	**121**
3	23	28	34	49	**134**
	59	**81**	**101**	**140**	**381**

Table F

UK Firms Pooled Sample Sizes by Portfolio Across Years

Portfolio	Best IR Officer	Best Results Meeting	Best Annual Report
1	153	136	126
2	147	133	121
3	161	143	134
Total	**461**	**412**	**381**

Table G

US Firm Portfolio Sample Sizes By Year

2000	Portfolios	Large	Small	Total
	1	76	229	305
	2	93	184	277
	3	188	615	803
		357	1028	1,385
2001	Portfolios			
	1	98	63	161
	2	36	82	118
	3	82	264	346
		216	409	625
2002	Portfolios			
	1	128	93	221
	2	117	123	240
	3	241	401	642
		486	617	1,103

Table H

US Firm Sample Sizes by Portfolio Across Years

Portfolios	Large	Small	Large and Small
1	302	385	**687**
2	246	389	**635**
3	511	1,280	**1,791**
	1,059	**2,054**	**3,113**

Table I

Note: In this table the 'buy-side' category includes both buy-side brokers and fund managers.

UK IR Awards Analysis of Survey Respondents 1999 to 2002

	Total	Buy-side	Sell-side
1999			
Best IR Officer	**114**	50	64
Best Annual Report	**95**	62	33
Best Results Meeting	**106**	71	35
2000			
Best IR Officer	**221**	75	146
Best Annual Report	**158**	92	66
Best Results Meeting	**198**	10	188
2001			
Best IR Officer	**310**	234	76
Best Annual Report	**159**	97	62
Best Results Meeting	**188**	146	42
2002			
Best IR Officer	**310**	210	100
Best Annual Report	**179**	85	94
Best Results Meeting	**179**	91	88
Totals	**2,217**	**1,223**	**994**
	100%	**55.1%**	**44.8%**

Table J

Note: In this table the 'buy-side' category includes both buy-side brokers and fund managers.

US IR Awards Analysis of Survey Respondents 2000 to 2002

	Total	Buy-side	Sell-side
2000			
Best Large Cap IR	**2,704**	1,543	1,161
Best Small Cap IR	**2,510**	1,987	523
2001			
Best Large Cap IR	**1,247**	985	262
Best Small Cap IR	**669**	501	168
2002			
Best Large Cap IR	**805**	403	402
Best Small Cap IR	**640**	573	67
Totals	**8,575**	**5,992**	**2,583**
	100%	**69.9%**	**30.1%**

Appendix 2

Table K

Descriptive Statistics of US and UK IR Award Firms Market Values

This table shows the average market value (£000's) across all firms nominated in each IR award at 31st March of the year in which the firms are nominated.

UK Firms

		Best IR Officer		Best Results Meeting		Best Annual Report
	N	461		412		381
		£'000		£'000		£'000
Mean		10,810		11,748		13,734
Std. Deviation		34,071		30,637		55,386
Minimum		560		890		1,070
Maximum		512,833		258,188		896,756
Percentiles	25%	558	25%	671	25%	510
	50%	2,141	50%	2,745	50%	2,138
	75%	7,601	75%	8,632	75%	8,424

US Firms

		Large Firms		Small Firms
	N	1,059		2,054
		£'000		£'000
Mean		19,320		685
Std. Deviation		45,873		776
Minimum		3,000		100
Maximum		465,627		2,990
Percentiles	25%	3,000	25%	100
	50%	4,555	50%	282
	75%	15,167	75%	1,046

Appendix 3

Table L

Summary of Cost of Equity Capital Estimates from Existing Literature

Author	Firm Type	Dates	N	Method of Estimation	Mean	Standard Deviation	Min	Max	Median
Gietzmann and Ireland (2004)	UK IT industry Firms	1992 - 2002	301 firm-years	Residual Income variant model with forecasted EPS	0.107	0.060	0.006	0.609	0.101
								Percentiles	
Botosan and Plumlee (2005)	US AIMR survey firms	1983 - 1993	12,400 firm-years	**Method of Estimation**	**Mean**	**Standard Deviation**	**25%**	**50%**	**75%**
			1	Discounted dividends and forecasted share price	0.064	0.069	0.019	0.057	0.100
			2	Discounted ROE based on industry average	0.010	0.037	-0.007	0.010	0.027
			3	Finite Horizon Dividend Growth Method	0.021	0.032	0.002	0.020	0.038
			4	Discounted returns based on economy wide averages	0.066	0.039	0.041	0.061	0.086
			5	Discounted price and earnings and forecast growth rates	0.050	0.048	0.018	0.044	0.073
			6	Buy-and-hold realised returns over 12-months	0.125	-0.475	-0.156	0.050	0.300
Botosan (1997)	US firms	1991	122	Ohlson Residual Income	0.201	0.100	0.133	0.190	0.247
				Low analyst coverage 62	0.221	0.117	0.150	0.204	0.271
				High analyst coverage 60	0.181	0.073	0.116	0.178	0.240

Appendix 3 continued

Nash (2005)

	Dates	N	Method of Estimation	Mean	Standard Deviation	Percentiles		
			Finite Horizon Gordon Growth Model			25%	50%	75%
US firms	2000 – 2002	3,113		0.092	0.096	0.030	0.076	0.119
UK firms	1999-2002							
	Best IR Officer 461 firms			0.109	0.081	0.046	0.101	0.153
	Best Results Meeting 412 firms			0.126	0.099	0.055	0.112	0.170
	Best Annual Report 381 firms			0.111	0.088	0.048	0.101	0.153

Appendix 4

Table M

Summary of Analyst Coverage from Existing Literature

Author	Firm Type	Dates	N	Data Source	Mean N	Percentiles 1%	25%	50%	75%	99%
Lang and Lundholm 1996	US AIMR	1985 - 1989	751 firms	I/B/E/S	17.6	2.4	9.9	16.7	24.3	39.8
Botosan 1997	US AIMR	1991								
	Full Sample		122	I/B/E/S	11.5	1.0	5.0	9.0	15.0	41.0
	Low analyst coverage		62	I/B/E/S	4.8	0.0	3.0	5.0	7.0	9.0
	High analyst coverage		60	I/B/E/S	18.4	10.0	12.0	15.0	22.5	42.0
Nash 2004	US *IR Magazine*	2000 - 2002	3,113 firms	FirstCall I/B/E/S	9.7	1.0	3.0	5.9	14.9	20.1
			Large 1,059		16.3	13.0	13.8	14.5	17.8	23.0
			Small 2,054		3.9	0.4	0.9	2.1	4.9	7.3
Nash 2004	UK *IR Magazine*	1999 - 2002		FirstCall I/B/E/S						
			Best IR Officer 461		7.7	1.0	4.0	7.5	7.0	8.5
			Best Meetings 412		7.5	1.0	3.5	7.0	7.5	8.0
			Best Annual Report 381		7.9	1.0	5.0	7.0	8.5	9.7